Chapter 6

THE POLLUTION-RELATED HEALTH DAMAGE COMPENSATION LAW

MICHIO HASHIMOTO

6.1 INTRODUCTION

Enacted on 10 October 1973, Japan's Pollution-Related Health Damage Compensation Law[1] established a much needed, pollutor-financed, nationwide compensation system for victims of designated illnesses caused by air and water pollution. While many nations, including Japan, have laws to control the emission of substances toxic to the environment, only Japan has a comprehensive program to provide financial and other aid to pollution victims. This chapter presents Japan's four major pollution incidents during the 1950s and 1960s, the litigation based on these incidents, pollution legislation prior to the Compensation Law, and the legislative history, mechanics, and an assessment of the Compensation Law.

During the 1950s and 1960s, Japan was absorbed with economic recovery. Government, industry, and the scientific community were largely unprepared for and unconcerned by the pollution illnesses which began to appear in the 1950s. In 1955, a local scientist in the village of Fuchu in Toyama prefecture on Honshu was the first to correctly diagnose itai-itai disease (cadmium poisoning), an illness which had been endemic since 1910. In 1956, physicians reported a new disease of unknown etiology in the vicinity of Minamata Bay in Kumamoto prefecture on Kyushu. Not until 1968 did the Ministry of Health and Welfare officially recognize that the so-called Minamata disease is caused by ingestion of methylated mercury, a byproduct in the production of acetaldehyde. In 1965, a second outbreak of Minamata disease was reported in the city of Niigata in Niigata prefecture on Honshu. In 1961, residents of the city of Yokkaichi in Mie prefecture on the Pacific coast of Honshu, the site of a large complex of oil refineries and petrochemical and power plants, developed asthma, emphysema, bronchitis, and other respiratory ailments.

It took a long time for attitudes towards pollution to change in Japan. The victims were mostly poor, isolated, and inarticulate, and the pollutors were callous and indifferent to their suffering. The development-oriented government authorities had other priorities--to promote industry at all costs

and to make Japan internationally competitive. Perhaps this environment helps to explain why it took thirteen years after the initial outbreak for the Kumamoto victims of Minamata disease to decide to file suit against the Chisso Corporation.

In decisions which broke new ground doctrinally, the courts ruled in favor of the plaintiff-victims in all four cases, and awarded them damages. In the itai-itai case, the court held the defendant strictly liable under article 109 of the Mining Law.[2]

In the Yokkaichi and the two Minamata disease cases, the courts held the defendants negligent. The courts found that the pollutors had a duty to use the most advanced techniques to detect and measure toxic substances in their industrial processes, and to conduct a program of continuous research on the possible hazardous effects of substances where risks were unknown. In addition, defendants had a duty to monitor the effects of such substances on the environment, use the most advanced technology to control these substances, and to terminate operations where necessary to avoid jeopardizing human health.[3]

Rendered between June 1971 and March 1973, the decisions were devastating to industry and contributed to society's acceptance of the notion that industry was responsible for the pollution it caused. Moreover, the trials were highly publicized, and they helped to arouse and mobilize the indignation of the citizens. The effect of the trials is most clearly manifested in the area of legislation. During the period of greatest national ferment over the trials, the government promoted the enactment of the strict liability amendments to the air- and water-pollution control laws,[4] and it passed the Pollution-Related Health Damage Compensation Law as a direct legislative response to the Yokkaichi decision.[5]

6.2 THE FOUR POLLUTION CASES

6.2.1 Minamata disease in Kumamoto prefecture

On 21 April 1956, pediatricians at the hospital attached to the Minamata plant of Chisso Corporation examined a six-year-old girl with symptoms of brain damage caused by unknown mechanisms. Physicians and townspeople at first called this perplexing affliction the "strange disease of Minamata." Government agencies and private groups conducted studies on the new illness to discover its cause and treatment, but definitive answers remained elusive for years. By 1977, the disease would afflict 910 people living in the coastal area of Minamata Bay.[6]

The victims of this most well-known of Japan's pollution diseases became the center of a national uprising against pollution.[7]

Minamata disease is a neurological disorder due to methylated mercury poisoning. It is very painful, causes tremors, and leads to severe, permanent

neurological and mental disabilities or death. Victims of Minamata disease show symptoms similar to those of the Hunter-Russell syndrome, -- a disease reported in Britain in 1940 which afflicted workers who handled various mercury compounds.[8]

Because pregnant women poisoned by mercury transmit the toxin through the placenta to their fetuses, many children born in Minamata during the mid- and late-1950s were afflicted with the disease.[9]

Beginning in February 1946, Chisso Corporation discharged its waste water containing methylated mercury through the Hyakken Channel into Minamata Bay. Methylated mercury was a byproduct of Chisso's acetaldehyde production process, which was produced for use in the manufacture of an acetic acid compound. Gradually, the mercury settled in the bottom sediment and concentrated in the tissues of fish and shellfish. The residents of Minamata became poisoned by the mercury by eating the contaminated seafood.

It took many years for physicians and scientists to understand the etiology of Minamata disease. During the hospital examination of the first case in April 1956, it was learneed that there were two others with the same symptoms in the patient's neighborhood. Alarmed by the seriousness of the outbreak, the hospital reported the incident to the Minamata Health Center. Health officials surveyed the area and found about forty afflicted patients. Family members had been concealing individuals with the disease because they had been quickly labeled as suffering from a communicable disease and the conventional belief persisted that patients of communicable diseases should be hidden from sight. The investigating officials also learned that large fish had floated to the surface of Minamata Bay, and that cats which ate those fish became afflicted with the same disease. One count taken by a house-to-house survey found that 50 out of 60 cats that lived in 40 patients' households died during 1953 to 1956. House cats usually died a couple of months before a member of the same household was taken ill.[10]

Thereafter, on 28 May 1956, local health officials formed the Action Committee on the Strange Disease at Minamata. The Action Committee conducted a study of the unknown disease and requested Kumamoto University Medical School to investigate the matter. On 24 August 1956, the Medical School organized the Minamata Disease Medical Research Team, consisting of doctors and other scientists from Kumamoto University Medical School. The Medical School suspected industrial waste from Chisso, but it took several years to collect and analyze the data.

In June 1957, Professor Takeuchi of the Kumamoto University Medical School pointed to organic mercury as a possible causative agent.[11]

In February 1959, the Medical School began to monitor the concentration and distribution of mercury in the fish, shellfish, and bottom sediment of Minamata

Bay. It was discovered that in September 1958, Chisso had changed the site of its waste-water dump from the Hyakken Channel to the Yawata Pool, which leads into the mouth of the Minamata River. In March 1959, six months later, the first cases of Minamata disease began to appear in patients living near the mouth of the river.[12] With this and other evidence, in July 1959, Kumamoto University Medical School published its conclusions on the cause of Minamata disease. It proposed the organic mercury theory, which later proved to be correct.

Chisso immediately denied that its production process produced organic mercury. In support of this contention, it noted that the catalyzer used in its acetaldehyde manufacturing process was inorganic mercury, a harmless substance. Nevertheless, Kumamoto University Medical School continued its search for the definitive cause of Minamata disease. In this effort, it was supported by funds from Japan's Ministry of Education and the National Institutes of Health of the United States Public Health Service. In 1960, Professor M. Uchida of the Kumamoto University Medical School crystallized an organic mercury compound from an extract of shellfish in Minamata Bay and identified sulfur in the alkylmercury. In September 1961, at the Seventh International Neurology Assembly, Professor Uchida identified the chemical as a methyl mercury-compound.[13] In October 1960, Professor K. Irukayama had taken a sample of sludge from the waste water outlet of Chisso's factory and later identified methyl mercury chloride (CH_3HgCl) in the substance.[14] Thus, methylmercury had been found both in Chisso's waste water and in the fish eaten by Minamata residents.

A number of other studies which produced different theories proceeded in parallel with the investigation conducted by Kumamoto University Medical School. After the first outbreak in April 1956, Kumamoto prefecture requested the Ministry of Health and Welfare to monitor the spread of the disease. The Ministry organized a study team headed by the dean of Kumamoto University Medical School and the director of the prefectural health department. After an initial study, the Ministry of Health and Welfare study team pointed to heavy-metal poisoning as the suspected cause of the disease. In 1957, the Food Sanitation Division of the Ministry of Health and Welfare took over responsibility for the case from the Control Division. In July 1957, it published the manganese-selenium-thallium theory, which proposed that fish and shellfish served as transmission media for these heavy metals. In July 1958, the director general of the public health bureau of the Ministry of Health and Welfare ordered a scientific study based on the theory that industrial wastes contaminated the bottom sediment of Minamata Bay, which in turn contaminated fish and shellfish and poisoned humans through unknown mechanisms. Again, Chisso denied that this was the cause, noting that the amounts of manganese, selenium and

thallium in its waste water were below toxic levels. Later, the Ministry of Health and Welfare began to suspect mercury poisoning. On 12 November 1959, the Food Sanitation Council of the Ministry of Health and Welfare issued its report on the cause of the disease to the Minister of Health and Welfare. The report concluded that a type of alkylmercury compound in the fish and shellfish of Minamata Bay caused the disease. The report further concluded that industrial-waste effluent was probably the source of the alkylmercury contamination. However, the report did not contain any scientific proof of this theory due to restrictions on investigation set forth in the Food Sanitation Law. In a cabinet session, the Minister of Health and Welfare reported that the Minister of International Trade and Industry claimed that it was too early to point to alkylmercury discharged in industrial-waste effluent.

In 1964, the Ministry of Health and Welfare established the Division of Environmental Pollution Control. Professor H. Shiraki of the Kumamoto University Medical School convinced the Division of Environmental Pollution Control to take an interest in his research on the Minamata disease.[15]

After discussing the matter, the Ministry of Health and Welfare decided to publish a monograph on Minamata disease research. The monograph was a compilation of all the studies and reports by members of the Kumamoto University Medical School Minamata Disease Medical Research Team from 1956 to 1963. It was funded by a new budget item contained in the 1965 fiscal budget.

The Economic Planning Agency had jurisdiction over matters under the Water Quality Conservation Law.[16] Nevertheless, it did not take jurisdiction of the Minamata disease incident under the authority granted by this statute because it was difficult to have new water zones designated for water pollution control purposes. However, in January 1960, the Economic Planning Agency organized the Minamata Disease Comprehensive Study Liaison Committee. While legislation limited the scope of permitted activities of the Ministry of Health and Welfare to medical research, the Liaison Committee did not have such limitations. Nevertheless, after only four sessions, officials dissolved the Liaison Committee in March 1961. At its dissolution, the committee had failed to reach any conclusions.

Other groups with an economic interest in the outcome of the studies on the Minamata disease organized their own research efforts. For example, the Japan Chemical Industry Federation established a study committee to explore theories which would work against the alkylmercury theory.

Even Chisso conducted an internal investigation of the poisoning. It carried out secret experiments on cats and obtained toxicological results similar to the cerebellar findings of the Minamata disease pattern. However, Chisso kept this information confidential and stopped the experiments.[17]

Later, the Kumamoto court would point to Chisso's knowledge of its own guilt

to void a patently unfair settlement agreement between Chisso and the Minamata victims. In other research carried out in 1962, Chisso identified CH_3Hg in the reactor drain of its acetaldehyde manufacturing plant, -- the same compound that had been identified by Professor Irukayama of Kumamoto University Medical School in 1960. Chisso also chose not to disclose the findings of this study.[18]

The suspected presence of mercury in Minamata Bay hurt the area's economy. In 1957, Kumamoto prefecture recommended a voluntary stop of sales of fish caught in Minamata Bay as a precautionary measure. When the presence of Minamata disease patients was confirmed in an area extending north of the City of Minamata, no one was willing to buy fish caught along the entire Shiranui coast. Members of the Minamata City Fishermen's Union as well as fishermen in neighboring towns could no longer engage in their livelihood. They demanded and received compensatory payments from Chisso Corporation.

Chisso also entered into settlement agreements with the victims of Minamata disease. On 15 August 1957, the victims formed the Mutual Aid Society of Patients of Minamata Disease and their Families in order to negotiate a settlement with Chisso. On 1 December 1959, the victims asked that the Conciliation Committee on Disputes Concerning Fisheries on Shiranui Coast, a group set up by the governor of Kumamoto prefecture, take up the problem of compensating the victims. On 31 December 1959, Chisso and the victims agreed on the terms of compensation. The agreement required Chisso to pay extremely small sums as sympathy money without admitting guilt. Article 5 of the agreement stated that "Even if it is determined in the future that Minamata disease is caused by water discharged from [Chisso's] factory, [the victims] shall make no further claim for compensation whatsoever."[19]

On 20 March 1973, the Kumamoto district court ruled that this provision was void as against public policy because, at the time the agreement was entered into, Chisso had known from its internal investigations, that its waste water contained methylated mercury.

6.2.2 Minamata disease in Niigata prefecture

In January 1965, Professor Tadao Tsubaki of the Niigata University Medical School Hospital diagnosed the Hunter-Russell syndrome in a 65-year-old patient. In April 1965, he confirmed the same diagnosis on a second patient. In view of these diagnoses, Professor Tsubaki initiated a clinical and epidemiological study in the downstream area of the Agano River basin in Niigata prefecture. He measured the alkylmercury content in hair and environmental samples. In May 1965 at the Kanto Neurology Society Meeting, Professor Tsubaki reported four cases of alkylmercury poisoning (one fatal). He also reported the findings to the Niigata prefectural government and characterized them as an outbreak of alkylmercury poisoning of unknown origins.[20] In June 1965, the prefecture

reported these findings to the national government.

Several study teams were quickly organized to investigate the source of the mercury which had caused the poisonings. Niigata prefecture, Niigata University, and the Ministry of Health and Welfare organized the Niigata Prefecture Mercury Poisoning Research Center, later called the Niigata Prefecture Organic Mercury Poisoning Research Center. The Economic Planning Agency and the Ministry of International Trade and Industry began separate investigations. Also, the Science and Technology Agency formed an inter-ministerial study team comprised of itself, the Ministry of Agriculture, Forestry and Fisheries, and the Ministry of Health and Welfare. Within the Ministry of Health and Welfare, the Division of Food Sanitation studied the disease's epidemiology and the Division of Environmental Pollution Control monitored industrial plants which used mercury.

From the studies conducted in connection with the Kumamoto Minamata disease in the late 1950s and 1960s, it was known that alkylmercury contamination caused Minamata disease. Thus, the issue in Niigata prefecture was the source of the alkylmercury which caused the Niigata poisoning, and the several study teams concentrated on this question. This was a significant difference in approach between the Kumamoto and Niigata incidents.

The study teams proposed three theories on the source of the mercury which had caused the poisonings: (i) spillage related to the earthquake that rocked Niigata in June 1964; (ii) spillage from an upstream plant which used mercury; and (iii) spillage from a downstream plant which used mercury. The three theories caused serious scientific controversies. Towards the end of June 1965, teams from Niigata prefecture found high concentrations of mercury in fish, and issued an order prohibiting fishing along a length of 14 kilometers of the Agano River.

In March 1966, the Niigata Prefecture Organic Mercury Poisoning Research Center concluded that contaminated fish from the Agano River caused the alkylmercury poisoning associated with the Minamata disease. Meanwhile, on 24 March 1966. the Ministry of Health and Welfare released an interim report which identified the Kanose plant of Showa Denko Corporation, an acetaldehyde manufacturer, as the suspected source of mercury pollution. However, the report also said that the earthquake which shook Niigata on 16 June 1964 contributed to the contamination of the river fish by altering the course of the river and disrupting its riverbed. Thus, the judgement of the Ministry of Health and Welfare remained inconclusive due to a lack of concrete scientific evidence.

In May 1966, Professor Y. Takizawa of Niigata University, who had formed an independent study team, reported that his group had measured high levels of mercury in sludge and algae samples at the drainage site of the Kanose plant[21] and that he had identified methylated mercury in the samples.[22]

In 1966, the health department of Niigata prefecture confirmed the findings of Professor Takizawa. Showa Denko objected to the findings of Professor Takizawa and the interim report of the Ministry of Health and Welfare. In rebuttal, Showa Denko proposed that mercury pesticides caused the mercury pollution in the Agano River. It also proposed that the 1964 earthquake contributed to the pollution.[23]

A tidal wave caused by the earthquake had flooded sheds stored with agricultural chemicals. After a second earthquake hit Niigata in July 1966, Niigata prefecture conducted an on-the-spot examination of the disposal of soaked pesticides, and was assisted in this effort by an executive from the Kanose plant. Showa Denko retained Professor T. Kitagawa of Yokohama National University to develop and present the saline wedge theory of methylmercury contamination in order to support the fertilizer spillage theory.[24]

In December 1966, the Safety Engineering Society, chaired by Professor T. Kitagawa, organized a team to investigate the mercury poisoning.

On 20 April 1967, the Ministry of Health and Welfare study team issued its report. The report found that the concerned events constituted a second outbreak of the Minamata disease, that fish in the Agano River contaminated by methylmercury caused the incident, and that the methylmercury came from discharges into the Agano River from the acetaldehyde manufacturing process of the Kanose plant of Showa Denko. The ministry forwarded its report to the Council of Food Sanitation, an advisory body to the Ministry of Health and Welfare, for its review. But the council backed off from the conclusiveness of the ministry's report. In its own report, issued on 30 August 1967, the council said that the long and extensive pollution of the Agano River by waste water discharged from the Kanose plant provided the first basis for the disease's appearance. However, the council continued, most patients became ill during a limited period when the concentration of mercury increased rapidly, and the factors contributing to this rapid concentration are unknown at this time. The council's report became the official position of the Ministry of Health and Welfare.

There was disagreement among the ministries and agencies as to the correctness of the conclusions of the Ministry of Health and Welfare. In December 1967, in response to an inquiry by the Science and Technology Agency, the Ministry of Agriculture, Forestry, and Fisheries, and the Economic Planning Agency indicated that their teams officially agreed with the conclusions of the Ministry of Health and Welfare. However, the Ministry of International Trade and Industry took the position that the evidence was insufficient to identify a source for the mercury pollution in the Agano River. In March 1968, Showa Denko criticized the conclusions of the Ministry of Health and Welfare as biased.[25]

The Science and Technology Agency also was reluctant to confirm the conclusions of the Ministry of Health and Welfare. It drafted the findings of the interministerial study team, which were inconclusive with respect to an identification of the source of the pollution. The Science and Technology Agency report, released on 26 September 1969, became the official position of the government.

After the report was issued, the Ministry of International Trade and Industry issued directives to 49 industrial plants owned by 35 companies on mandatory measures to prevent mercury contamination.

6.2.3 Itai-itai disease in Toyama prefecture

In October 1955, at the 17th Assembly of the Japan Clinical Surgeon Society, Dr. Noboru Hagino and Dr. M. Kawano reported a disease of unknown etiology which had been endemic since 1910 in Fuchu and the surrounding area of Toyama prefecture. Characteristic symptoms were severe lumbar and femur pains, osteomalacia, splintering of bone tissue, disfigurement, posture deformation, crippling, and renal disorder. Death often resulted. The unbearable pain caused the Toyama victims to cry out itai-itai ("it hurts, it hurts"), from which the disease got its name.[26]

Victims had resided in the area for more than twenty years. Women aged 50 with a history of multiple pregnancies and lactation were especially susceptible.

An alluvial fan formed by the Jintsu River constituted the endemic area. This river irrigated the traditionally agricultural surrounding land. The Kamioka Mine of the Mitsui Mining Company was located about 50 kilometers upstream along the Jintsu River, and it had produced gold, silver, copper, and zinc since the 1890s. The mine had a long history of leaking wastes and effluent into the agricultural lands downstream. Because most victims were poor, hard-working farmers, for many years it was thought that the disease was the result of undernourishment and overwork. But in 1961, at the 34th Assembly of the Japan Orthopedic Society, Dr. Hagino and Professor K. Yoshioka hypothesized that chronic poisoning by cadmium contained in mining wastes and effluent caused itai-itai disease. The theory proposed that farmers living in the delta of the Jintsu River ingested cadmium by drinking the water of the Jintsu River and eating rice taken from paddies irrigated by it.

In 1963, the Ministry of Health and Welfare organized the Itai-Itai Disease Study Committee to review clinical and public health issues. The Division of Environmental Pollution of the Ministry of Health and Welfare formed a committee and reviewed all reports and references in Japan and abroad on the subject. It also examined environmental pollution at several zinc sites polluted by heavy metals. Its field study focused on environmental pollution caused by

trace metals in the air, water, soil, and biological media. In addition, the Ministry of Education organized the Itai-Itai Disease Comprehensive Study Team, which took an interdisciplinary approach. Finally, Toyama prefecture established the Toyama Prefecture Special Local Disease Countermeasures Committee to study the matter.

In January 1967, the Ministry of Education study team issued its final report on the etiology of itai-itai disease. The report concluded that cadmium poisoning probably caused itai-itai disease. The Division of Environmental Pollution of the Ministry of Health and Welfare continued its investigation and reported that it had detected cadmium pollution in several areas and observed signs of renal disorders and suspected cases of osteomalacia.[27]

In May 1968, the Ministry of Health and Welfare concluded that cadmium was merely one of many contributing factors. In its report, the Ministry stated that "Itai-itai disease is primarily attributable to the renal damage by cadmium poisoning with subsequent osteomalacia, induced by multiple pregnancy, lactation, hormonal disorder, aging, and calcium deficiency due to malnutrition. Experts have not identified any source of cadmium pollution other than the mining effluent of the Kamioka Mine of the Mitsui Mining Company." The Minister of Health and Welfare reported these conclusions during a cabinet session, and the government adopted them as its conclusions.

In January 1968, Toyama prefecture finally established a relief system for patients of itai-itai disease. The system registered those undergoing diagnostic study and supplied patients with medical care at public expense. The Ministry of Health and Welfare agreed to reimburse patients for their medical expenses with funds from the Environmental Pollution Study Fund.

In March 1968, the study teams of Toyama prefecture, the Ministry of Health and Welfare, and the Ministry of Education agreed on diagnostic criteria for the disease. In addition, the Ministry of Health and Welfare issued provisional regulations requiring certain measures to be taken to prevent cadmium pollution. Also, it organized a team to study the disease and its mechanisms in more detail and, in particular, ways to prevent cadmium poisoning in the early stages of renal damage. The ministry noted that there was a low risk of a greater incidence of the disease because of two factors: (i) trends in the onset pattern of the disease observed from data from the 1920s to the 1940s; and (ii) the fact that local governments had built three dams along the Jintsu River by 1968.

The Ministry of Education's Itai-Itai Disease Comprehensive Study Team instituted nationwide surveillance of cadmium pollution in water, soil, and foods, and conducted community health screenings. The team based these measures on the Ministry of Health and Welfare's provisional cadmium pollution-control measures and the diagnostic criteria.

6.2.4 Air pollution in Yokkaichi

Japan's first petrochemical complex was located in the city of Yokkaichi in Mie prefecture. Commencing operations in 1959, the complex refined petroleum, produced petrochemicals, operated a power station using fuel oil with a high sulfur content, and manufactured titanium using sulfuric acid. Soon after the start-up, residents in Yokkaichi became very annoyed with the black smoke and soot from the new plant. Also, the fish caught along the shore of this small Pacific-coast city emitted a strong, oily smell and proved unmarketable. Beginning in 1960, local physicians noted an abnormal increase in the incidence of asthma, emphysema, bronchitis, and other respiratory ailments.

In a study sponsored by prefectural and city governments, Professor K. Yoshida of the Public Health Laboratory of Mie Prefecture University Medical School conducted a statistical analysis of the clinical records of patients in Yokkaichi from 1961 to 1968 using the national health insurance payment claims. Professor Yoshida examined the records of 30,000 patients residing in 13 districts in the city of Yokkaichi classified as polluted and non-polluted. In most disease categories, the study found no differences between patients from polluted and non-polluted areas. However, there were notable differences in four disease catagories: common cold, bronchial asthma, throat inflammation, and eye irritation. The results show that the number of visits per 100 persons (the incidence rate) in polluted districts was two or three times that of unpolluted districts, and that the incidence rate rose with increasing sulfur-dioxide concentrations. Elderly and very young children were more adversely affected than young adults.

Beginning in 1960, officials began to monitor air-pollution levels in the city of Yokkaichi using the PbO_2 candle method and deposit gauge. In addition, officials set up a sulfur-dioxide automatic air-monitoring device in the dispensary of a fishing village.[28]

The dispensary noted that 13 patients under its observation had developed asthma-like symptoms since the start of the air-monitoring program. The correlation between the sulfur-dioxide concentration and the development of asthma-like symptoms was as high as 0.88 percent. The dispensary observed a sharp increase in the number of onsets of asthma-like symptoms when the weekly average sulfur-dioxide concentration reached 0.1 to 0.2 ppm. In the village of Isozu, officials observed an abnormally high incidence of bronchial asthma among people over 50 years of age. In almost all of these bronchial asthma cases, onset began after 1959, the patients had low rates of positive reactions to house dust and other allergen tests, and the patients' family histories showed low rates of bronchial asthma.[29]

In 1963, the Ministry of Health and Welfare began a study of air pollution and its health effects in Yokkaichi and Osaka. The study used the British

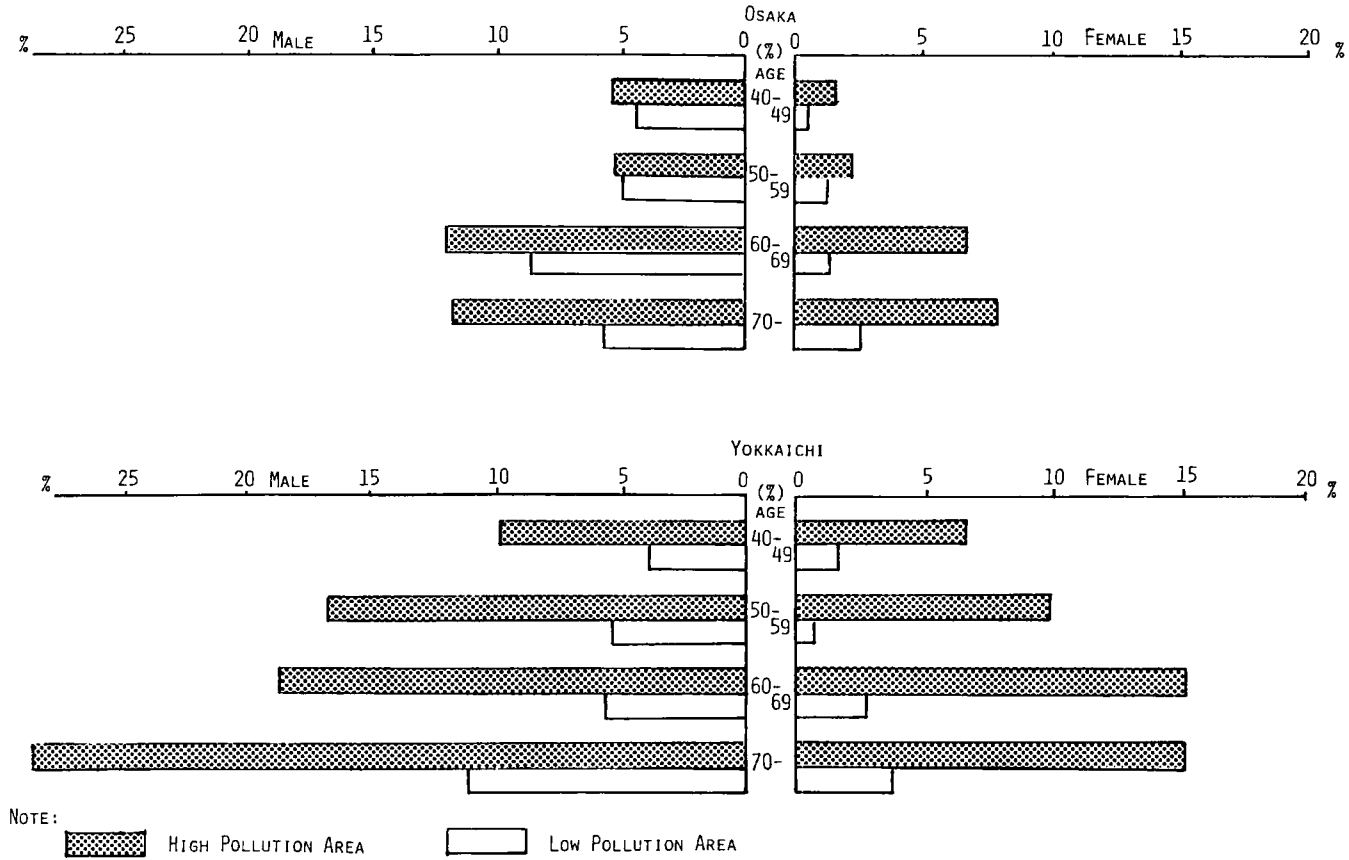

Fig. 6.1. Prevalence of respiratory symptoms classified by age and sex in Osaka and Yokkaichi,1964.

Medical Research Council (BMRC) questionnaire survey method and pulmonary function test developed by Vitalor (Fig. 6.1). The study monitored frequent and continuous peaks of sulfur dioxide concentrations, with a maximum concentration of 2.5 ppm/hr. It often recorded measurements of 1 ppm/hr, and in special meteorological conditions it recorded 0.4 ppm/hr continuously. The heights of the smoke stacks of the petrochemical complex were all below 60 meters. Officials observed a high concentration of sulfur dioxide in the winter with a downwash phenomenon of 6 m/sec. In the central area of Yokkaichi, officials observed a northwest wind in the winter and a southeast wind with high peaks in the summer.[30]

In 1963, the Ministry of Health and Welfare and the Ministry of International Trade and Industry established the Kurokawa Commission, a multidisciplinary team of experts, to investigate the cause of the air pollution problem and to prescribe comprehensive measures to control it. The Kurokawa Commission considered the findings of the studies on air pollution and its health effects and recommended minimum height requirements for smoke stacks and the institution of special health care programs.

Meanwhile, the anti-pollution campaign gradually intensified in Yokkaichi, and also in Mishima-Numazu where a second petrochemical complex was located. Mishima-Numazu activists persuaded local landowners not to sell their land to the advancing industries and began massive demonstrations against the proposed complex. They rallied support with the slogan "No more Yokkaichi," and in 1964 they succeeded in closing the Mishima-Numazu plant.[31] The citizens' success had grave implications for the siting of new complexes and for economic growth generally. It persuaded the government to actively set to work on the formulation of a comprehensive pollution policy.

In 1965, the Ministry of Health and Welfare released the results of its study of air pollution and its health effects in Yokkaichi and Osaka. After many months of struggle, the residents of Yokkaichi persuaded Mie prefecture to establish the Pollution-Related Medical Care Program to reimburse the medical expenses of air-pollution victims whose bills were not completely covered by national health insurance. However, air pollution in Yokkaichi worsened between 1965 and 1967, and more serious cases of pulmonary disease appeared. By 1969, the Medical Care Program had certified 600 patients.[32]

In 1967, the Ministry of Health and Welfare provided funds to the Pollution-Related Medical Care Program for Yokkaichi on the condition that polluting industries make contributions to the fund. Although on a small scale, the program was effective, and in 1973 the air-pollution program of the Compensation Law was modeled in part after it. In 1965, officials succeeded in gradually lowering the high sulfur-dioxide levels with the implementation of the air-pollution-control recommendations of the Kurokawa Commission. In addi-

tion, Mie prefecture enacted an ordinance in 1972 which instituted a program to reduce sulfur. The ordinance set maximum permitted levels of sulfur emission as measured by mass.

6.3 LITIGATION

After years of inaction on the part of pollutors, the victims of Niigata[33], Kumamoto[34], Yokkaichi[35], and Toyama[36] took their grievances to the courts. In all four cases, the courts ruled in favor of the plaintiff-victims, and awarded them damages. The decisions in the four major pollution trials established the basic legal principles governing claims for compensation of health injuries from air- and water-pollution. They were devastating for industry. They established standards of care far more stringent than any government regulation at the time. The publicity attending the trials made pollution a national issue and hastened the government's implementation of new and needed pollution laws and regulations, including the Compensation Law.[37]

Table 6.1 presents information on the identity of the plaintiffs and defendants, the date the suit was commenced and the date judgement was rendered, the legal basis of the decision, and the amount of damages awarded. Many of the victims were unfamiliar with legal proceedings and only turned to the courts after all other avenues of relief failed. The Toyama (itai-itai disease) and Kumamoto (Minamata disease) victims each waited thirteen years before agreeing to file suit. Their trials each took another four years. The Yokkaichi (air pollution diseases) and Niigata (Minamata disease) plaintiffs took eight and two years, respectively, to file suit. Their trials took another five and four years, respectively.

On 12 June 1967, the Niigata Minamata disease victims were the first to file suit. The action against the Showa Denko Corporation was based on a theory of negligence under article 709 of the Civil Code. Article 709 states, "A person who violates intentionally or negligently the rights of another is bound to make compensation for damages arising therefrom." This was the first time a court was called upon to apply this provision to a pollution case.

In construing this provision, the Niigata court set a very high standard of care for chemical companies which may produce hazardous substances as by-products in their production processes. The court ruled that a chemical company had to use the best analytical techniques to determine whether its waste water contained any hazardous substances. Moreover, such a company "must take the strictest safety precautions to prevent even the slightest danger to humans and other living things." If danger to human health still remains, "curtailment or cessation of operations may be necessary."[38]

The plaintiffs faced a formidable challenge in proving causation. It was known by this time from the many studies done in Kumamoto that ingestion of

methylated mercury resulted in Minamata disease, and this fact was not in dispute. The issue in Niigata was the source and mechanism of transmission of the mercury. The defendants contended that the mercury did not come from their plant but rather was part of the agricultural chemicals washed from storage sheds in Niigata Port by a tidal wave following the Niigata earthquake of 1964. The art of toxicology was not sufficiently advanced to permit a determination of causation with scientific precision. But the court disposed of this problem by resorting to statistical correlation. In effect, it ruled that the plaintiffs had met their burden of proof by demonstrating a high statistical correlation between the defendants' activity and the occurrence of the disease. Specifically, the plaintiffs used epidemiological and statistical analysis of mercury concentrations in different types of fish, percentages of contaminated fish consumed, and differential studies of the incidence of Minamata disease correlated with the type of fish eaten.

In rebuttal on the issue of liability, the defendants argued that they were not negligent because they had complied with existing effluent standards. However, the court dismissed this contention, stating that compliance with administrative regulations shields a tortfeasor from administrative sanction only, not civil liability.

The Kumamoto Minamata disease case also was devastating to Japanese industry. This action was based on a theory of negligence under Article 709 of the Civil Code. The court set a high standard of care. It said that if there was doubt about the safety of a chemical plant's waste water, the plant must immediately suspend operations and adopt the necessary maximum preventive measures. "Especially with regard to the life and health of area residents, the factory must exercise a high degree of care to prevent harm before it happens."[39]

In assessing damages, the court rejected the plaintiffs' request for uniform damages. It analyzed each plaintiff's circumstances to arrive at a fair and reasonable amount. In doing so, the court considered loss of income even though the plaintiffs' had only sought damages for emotional and mental suffering. The court noted that if the plaintiffs' had claimed pecuniary damages including loss of income, matters of proof would have been complicated and the victims' relief delayed.

The Yokkaichi case, filed against the six companies in the petrochemical complex, was brought on a negligence theory under the joint tort statute. Article 719 of the Civil Code states in part, "If two or more persons have by their joint unlawful act caused damage to another, they are jointly and severally liable to make compensation for such damage; the same shall apply if it is impossible to ascertain which of the joint participants has caused the damage." The court applied the joint tort statute because the discharges of

Table 6.1

Summary of major pollution litigation

	Niigata Minamata Disease Case	Yokkaichi Air Pollution Case
Date case filed	1st; June 12, 1967 8th; January 19, 1971	September 1, 1967
Date of Decision	September 29, 1971	July 24, 1972
Court	Niigata District Court	Yokkaichi Branch Tsu District Court
Number of Plaintiffs (including deceased plaintiffs)	1st to 8th, 77 (56)	12 (9)
Defendant(s)	Showa Denko Kanose Plant	6 companies of the first Complex, Mitsubishi Kase, Mitubishi Yuka, Mitsubishi-Monsant Kase, Showa Sekiyu Yokkaichi, Chubudenryoku, Ishihara Sangyo
Theory of action	Civil Law; Article 709, (Torts)	Civil Law; Article 709, (Torts) Article 719, (Joint Torts)
Damages Awardes	270 million Yen (Mental Suffering)	88.21 million Yen (Mental Suffering, Loss of Income, Lawyers' Fees)

Source: Attachment to the Report of the Central Advisory Council of Environmental Pollution Control Measures; 1973

Itai-itai Disease Case		Kumamoto Minamata Disease Case
Trial Court	Appellate Court	June 14, 1969
March 9, 1968	Defendant; June 30, 1971 Plaintiff; September 6, 1971	
June 30, 1971	August 9, 1972	March 20, 1973
Toyama District Court	Kanazawa Branch Nagoya High Court	Kumamoto District Court
31 (14)	34 (14)	138 (45)
Mitsui Kinzoku Kyogyo (Kamioka Kogyosho)		Shin-Nihon Chisso (Acetaldehyde Manufacturing Carbide)
Mining Law; (strict liability) Article 109;		Civil Law; Article 709, (Torts)
57 million Yen (Mental Suffuring)	148.2 million Yen (Mental Suffering, Lawyers' Fees)	737 million Yen (Mental Suffering, Lawyers' Fees)

some of the defendants were insufficient in themselves to cause injury. In holding each defendant liable for the total damage done by the combination, even defendants with only minimal discharges, the court stressed the importance of the tainted association rather than the amount of individual emission.

The issue of causation presented daunting doctrinal problems to the plaintiffs and the court. The Yokkaichi diseases--asthma, emphysema, bronchitis, and other respiratory ailments--have multiple causes, such as smoking, in addition to air pollution in the form of elevated sulfur oxides levels. Expanding on the decision in the Niigata Minamata disease case, the court held that a level of statistical probability creates a legal presumption of causation. It relied on complicated statistical and epidemiological evidence to show that the defendants were the source of the pollution and that the pollution was transmitted to the victims. For example, it used charts of sulfur oxides levels by year, data on seasonal wind patterns affecting pollution discharges, and comparisons of hospital records for pulmonary disease in polluted and non-polluted areas.[40]

In assessing damages, the Yokkaichi court ruled that the court should calculate individual income losses. To do this, it resorted to a standard workers' scale of wages classified by age and gender. This wage scale was published annually by the national government as part of its collection of official statistics. This aspect of the Yokkaichi decision was far-reaching because the plaintiffs included fishermen and housewives who did not receive a monthly salary.[41]

The Itai-Itai Disease case filed against the Mitsui Mining Company was based on a theory of strict liability under Article 109 of the Mining Law.[42]

Under strict liability rules, the plaintiff need not prove that a defendant breached a duty of care in causing the plaintiff's injury. However, the plaintiff must still prove that the defendant caused the plaintiff's injury. In showing causation, the court admitted epidemiological evidence such as data showing that most patients were found only in the delta irrigated by water from the Jintsu River. This was an important ruling because factors such as nutritional deficiency, climate, overwork, and vitamin D deficiency substantially weakened the victims' proof of causation based solely on clinical and pathological evidence.

The appellate court affirmed the district court's decision in favor of the plaintiffs. Like the district court, it emphasized the importance of epidemiology in determining legal causation. In addition, the appellate court increased the damages awarded to the plaintiffs by the district court. In doing so, it noted that the plaintiffs had failed to plead pecuniary losses because of the difficulty of proof and the need for an early decision. The appellate court took this into consideration in reassessing damages for pain

and suffering.

6.4 LEGISLATION

In the late 1960s and early 1970s, the government searched for an appropriate policy response to the mounting pollution crisis in Japan. The Diet enacted three pieces of legislation that were precursors to the 1973 Pollution-Related Health Damage Compensation Law. These were the 1967 Basic Law for Environmental Pollution Control Measures, the 1969 Special Relief Law for Pollution-Related Health Hazards, and the 1972 strict liability legislation.

6.4.1 The 1967 basic law for environmental pollution control measures[43]

The major policy goal of the Basic Law for Environmental Pollution Control Measures was to require the government to devise a systematic, comprehensive program to control pollution, and to require pollutors to pay their proportionate share of the government's costs. While the specific mechanisms to achieve these results were left to later legislation, this law set Japan on the course towards pollution control.

Article 2 of the Basic Law defined environmental pollution as any situation where air pollution, water pollution, noise, vibration, ground subsidence, or offensive odours, arising over a considerable area as a result of industrial or any other human activity, injured or damaged the health of humans or their living environments. The 1973 Compensation Law had its genesis in Section V of the Basic Law, which addressed the settlement of disputes related to environmental pollution and relief for damages. Specifically, Article 21 stated, "1) The government shall establish a system for settlement by such means as mediation and arbitration. 2) The government shall establish a system for the efficient implementation of relief for damage caused by environmental pollution." Furthermore, Article 22 stated, "An enterprise shall bear all or part of the necessary costs of the work undertaken by the State or local government bodies to control pollution arising from the activities of such an enterprise." The enactment of the Basic Law required the government to address the problem of administrative jurisdiction of pollution issues. This was necessary because pollution matters were being handled piecemeal by fourteen ministerial agencies.[44]

That it took until 1967 for Japan to enact its first major piece of pollution legislation has been a subject of much criticism. Twelve years passed before the government acknowledged that the Minamata disease was pollution-related. At first it was called a "strange, unknown disease", then a kind of food poisoning; only in the end did the government acknowledge that it was methylmercury pollution caused by industrial water pollution. An example of the government's delay was its refusal to accept the findings of the Food

Sanitation Council of the Ministry of Health and Welfare in 1959 or the Kumamoto University studies on the cause of the disease. In September 1965, three years after the second outbreak of Minamata disease in Niigata prefecture, the government finally agreed with the conclusions of the Ministry of Health and Welfare. The government was also slow in acknowledging the cause of itai-itai disease--which came thirteen years after the first-reported incidence. For the asthma-like disease of the Yokkaichi case, the government took five years after the public health studies were issued to acknowledge that the cause was pollution-related.

The reason which the government always cited to buy more time was the lack of solid scientific evidence. The author's degree of certainty with respect to identifying the source of the pollution was 99% for the Kumamoto Minamata disease, 80% for the Niigata Minamata disease, under 55% for itai-itai disease, and just over 50% for the Yokkaichi air pollution-case. The author based these assessments on his administrative experience in handling major pollution-related health issues from 1961 to 1970. In the process of arriving at a conclusion with respect to the source of the pollutants, the author continually faced scrutinizing questions and criticism. Critics demanded to see hard evidence of the cause and effect relation between the pollutants and the disease as well as scientific proof identifying the source of the pollutants. In this way, the rigors of scientific proof worked to provide a temporary shield for the pollutors.[45]

The preparation for drafting the Basic Law began in 1965 when both houses of the Diet organized Special Committees for Industrial Pollution Control. With mounting social and political turmoil, the Diet was under great pressure to take administrative action. Political power groups, the economic and industrial establishment, and the national and local governments were worried by the closing of the petrochemical complex at Mishima-Numazu. Increasingly, the government faced hostile questions in the Diet and in the media on pollution issues. After the Basic Law was enacted, opponents debated whether the Kumamoto and Niigata Minamata disease and the itai-itai disease cases came within the scope of the definition of pollution in Article 2. The Ministry of Health and Welfare finally addressed these questions in 1968 when it issued its policy position with respect to the Minamata and itai-itai diseases. The cabinet level policy positions were the top political decisions of the national government. This was the first time the government reached an important policy decision despite a lack of conclusive, scientific information.[46]

In accordance with the Basic Law, the Ministry of Health and Welfare subsidized the medical expenses of the Kumamoto and Niigata Minamata disease victims with funds from its health research budget. However, after 1968, the Ministry of Finance requested the Ministry of Health and Welfare to charge the indivi-

dual polluting enterprises with their proportionate share of the total medical expenses. Until 1968, national health insurance benefits and the public expenditures of national and local government had paid these medical expenses.

6.4.2 The 1969 special relief law for pollution-related health hazards[47]

In October 1967, the Ministry of Health and Welfare completed drafting a plan for the proposed victim relief system. The plan limited relief to medical expenses suffered by certified victims living in designated areas. Even this cautious proposal was rejected by other ministries as too generous. In February 1968, the ministry remanded the matter to the Advisory Council for Environmental Pollution Control Measures. The council, an advisory body to the prime minister on environmental matters, proposed a relief system limited to payment of medical expenses and funded in part by voluntary contributions from industry. After further debate and amendment of the Advisory Council's recommendations, the Diet passed the Special Relief Law for Pollution-Related Health Hazards during the 1969 session.

The Relief Law provided benefits for medical expenses, medical care, and nursery care. Since 1961, the national health insurance and social security programs have provided universal coverage in Japan. The Relief Law supplemented the benefits available to patients under these social insurance programs. However, the benefits provided under the Relief Law did not include payments for disability or pain and suffering.

The Relief Law set forth standards of eligibility for benefits. An applicant had to show that he was a victim of one of the following diseases: chronic bronchitis, bronchial asthma, asthmatic bronchitis, pulmonary emphysema, and their sequelae (the air pollution-related diseases) and Minamata disease, itai-itai disease, and chronic arsenic poisoning (the water pollution-related diseases). In addition, he had to show that he lived or worked for a designated length of time in an area identified by the government as affected by serious air- or water-pollution arising from industrial or individual activities.

There was a three-step procedure for certifying eligibility. First, a physician diagnosed an applicant as having a designated disease. Second, the Pollution-Related Health Hazard Certification Committee, established in each prefecture by the governor, determined whether the applicant met the standards for degree of exposure in a designated area. Finally, if all was in order, the governor certified the applicant.

Under the Relief Law, government and industry contributed funds for the payment of benefits. The national, prefectural, and local governments contributed half of the money for the relief fund in equal proportions, and the Foundation for Cooperation with Environmental Pollution Control Measures con-

tributed the other half. Established by the Japan Federation of Economic Organizations (Keidanren), the Foundation for Cooperation collected voluntary contributions from private enterprises without government participation. In turn, the Foundation for Cooperation transferred the collected funds to the Environmental Pollution Abatement Corporation, which the Ministry of Health and Welfare and the Ministry of International Trade and Industry had jointly established in 1965. The government also deposited its share with the Environmental Corporation. The corporation then transferred the funds to the departments of local government administering the programs under the Relief Law.[48]

The air-pollution program of the Relief Law was based on the Yokkaichi program begun in 1965. In December 1969, the cabinet designated Yokkaichi, Nishiyodo-ku in Osaka, and the southern half of Kawasaki City, near Tokyo, as health-hazard areas. The worst air pollution in the past decade had been observed in these three areas.[49]

Although the Relief Law was essentially a limited, stopgap measure, it took the persistent, persuasive efforts of the Division of Environmental Pollution Control of the Ministry of Health and Welfare, established in 1968, to push the program through.[50]

6.4.3 Strict liability legislation of 1972

On 1 July 1971, the government established the Environment Agency and assigned it the task of preparing strict liability legislation. Strict liability is a concept which replaces traditional tort principles based on negligence. Under strict liability rules, a victim must still pursue his relief through a lawsuit, but he need only show that his disease was caused by specific pollutants discharged by the defendant; he need not also show that the defendant was negligent in permitting the pollutants to be discharged.

The Environment Agency's draft bill, prepared by March 1972, presented a very narrow application of strict liability. Defending its bill during the hostile reception, the government argued that the new legislation should be limited to new cases of pollution injury and then only to injuries caused by air and water pollution generated by industrial activity. Thus, the bill did not apply to the other forms of pollution defined in the Basic Law--soil pollution, noise, vibration, ground subsidence, and offensive odours. Accordingly, the bill sought to amend the Air Pollution Control Law of 1968 and the Water Pollution Control Law of 1970. An early draft of the bill included a presumption of causation, but economic and industrial groups strongly opposed this provision and in the end it was deleted. At about the same time, the Liberal Democratic Party and the Federation of Economic Organizations (Keidanren) organized a task force to draft their own strict liability law. The government's bill passed the Diet on 16 June 1972.

The new law included a provision requesting the government to establish a pollution-related health injury compensation system. Earlier, in April 1972, the Central Advisory Council of Environmental Pollution Control Measures had established a Special Subcommittee for Cost Bearing to conduct an inquiry into how costs should be borne for a pollution-related health injury compensation system. Thus, the strict liability law served as an important step in bringing about the Compensation Law.

6.4.4 Shift in pollution policy: 1965-1972

The Japanese government, and the Japanese people, underwent a drastic change in their attitudes towards pollution from 1965 to 1972. This shift in policy can be marked by a number of events. The second outbreak of Minamata disease, in Niigata prefecture, occurred in 1965. From 1967 to 1969, the victims of Japan's four major pollution cases filed lawsuits. Until final judgments were issued in the plaintiffs' favor from 1971 to 1973, the cases attracted much press and organized public support. In 1965, both houses of the Diet established a Special Committee for Industrial Pollution Control to help formulate proposals for the 1967 Basic Law for Environmental Pollution Control Measures. In 1968, the government finally acknowledged that Minamata disease and itai-itai disease were pollution-related. This signaled the beginning of the government's change in pollution policy. In 1969, the United Nations and the Organisation for Economic Co-operation and Development (OECD) each held sessions on the environment which helped to raise the level of concern all over the world. Japan endorsed the OECD's pollutor-pays-principle. In early 1970, President Richard M. Nixon attacked Japan for taking a trade advantage by not paying the costs of pollution control. In July 1970, Japanese newspapers reported cases of lead poisoning in Tokyo and high photochemical oxidant levels. Earlier, there had been reports of high levels of mercury and cadmium. This kind of press was instrumental in provoking strong public demand for stringent pollution controls. Also in July 1970, former Prime Minister E. Sato established the Pollution Control Headquarters, comprised of senior ministry officials, under his personal supervision. In the autumn of 1970, the Diet held a ten-week special session to consider fourteen pieces of pollution legislation. Despite the complexity of the bills, all fourteen were enacted. However, Prime Minister Sato was unable to deliver on his commitment for strict liability legislation during the special session. But the Environment Agency began an intensive examination of the strict liability proposals, and the Diet passed a bill in July 1972. Two days later, the court in the Yokkaichi case issued its decision giving a strict interpretation of Articles 709 and 719 on tort and joint tort liability.[51]

These developments in July 1972 shocked the industrial establishment, and

marked a turning point in Japan's pollution policy. Immediately after the court issued its decision in the Yokkaichi case, State Minister O. Koyama, Director General of the Environment Agency, called for the enactment of legislation to provide for a pollution-related health damage compensation system as soon as possible. A nationwide consensus on the need for a compensation system was rapidly crystallizing. The pollutors' heaven, which Japanese industrialists had enjoyed for nearly a century, had suddenly crumbled, and the industrialists found themselves in a pollutors' hell.

6.5 THE POLLUTION-RELATED HEALTH DAMAGE COMPENSATION LAW

The major goal of the Pollution-Related Health Damage Compensation Law[52] is to provide an administrative, non-judicial system of compensating victims of environmental pollution. The law places the entire costs of the compensation program, except for administration, on pollutors.

The legislative process in Japan is different from many other countries. For important pieces of proposed legislation, the relevant ministry or agency of the government appoints a citizens' advisory council in which academics, other experts, and groups affected by the proposed legislation gather and negotiate as needed to obtain a consensus. Thus, by the time a bill is presented to the Diet for consideration, all the consensus-building groundwork has been done in this forum.

Formerly an advisory organ to the prime minister, the Central Advisory Council on Environmental Pollution Control Measures was transferred to the Environment Agency when it was created in 1971. There, the Advisory Council served the new agency's director general. There were about 30 active members on the Advisory Council, consisting of representatives from academia; the scientific community; polluting industries such as the automobile, iron, and steel industries; the general public; citizens' organizations; local governments; and the press. The Advisory Council was charged with the task of recommending legislation which would become the Pollution-Related Health Damage Compensation Law. In 1972 and 1973, the Advisory Council conducted an extensive review of all the technical issues, prepared a report recommending general policy positions for the proposed Compensation Law, and solicited comments from interested parties. The Advisory Council submitted its recommendations in a final report to the director general of the Environment Agency, which did the actual drafting of the proposed Compensation Law, codifying the Advisory Council's policy recommendations. The Diet enacted the Compensation Law on 10 October 1973, and it became effective on 1 September 1974.

6.5.1 The recommendations of the central advisory council on environmental pollution control measures

(i) An extra-judicial, administrative structure. The council argued that to require each victim seeking compensation for his health injuries to file a lawsuit in court would be too burdensome. Even with the new strict liability statutes, proving legal causation and damage in court would be too expensive, time-consuming, and risky. Also, even with the pro-victim Yokkaichi decision to serve as a persuasive precedent, an urban victim of an air pollution-related disease caused by multiple factors faced a heavy burden of proof with an uncertain outcome. Thus, the council recommended an extra-judicial, administrative structure to oversee compensation payments.

In addition, the council argued against integrating the compensation program with national health insurance or workmen's compensation. Integrating the compensation program with national health insurance would sever the link between the payment of compensation and the identity of the pollutors, thereby absolving pollutors of responsibility. Also, it would be unfair to non-pollutors to finance the compensation program from the general tax revenues. In addition, the council recommended that the compensation system pay for all medical expenses, not just as a supplement to that part of the expenses not reimbursed by national health insurance.[53]

(ii) Causation. The council believed that basic notions of fairness require a causal nexus between pollutant and victim before requiring pollutors to pay. Yet, science had not advanced to the point where it could prove this nexus with absolute certainty. Thus, in the interests of administrative expediency, and to relieve the terrible suffering of victims, the council adopted techniques of statistical probability and a rebuttable presumption of causation. The council refined the basic approach to causation developed in the pollution trials into a general methodology for disease, area and victim designation.

The council said, "Multiple factors contribute to pollution-related health damage. Thus, it cannot always be said with medical and scientific certainty that a given, single factor causes a particular disease. But for purposes of assigning liability in legal proceedings, it is satisfactory for plaintiffs to show a probability of causation. However, the showing of probability must be verified by epidemiological evidence on the degree of pollution and the incidence of disease."[54]

Different diseases have different degrees of specificity to a given pollutant. Minamata disease is specific to methylated mercury poisoning; no other pollutant or factor causes the disease. But the air pollution diseases (asthma, emphysema, bronchitis, and other respiratory ailments) have multiple causative factors, some of which are unrelated to industrial air pollution. Smoking is an example. Thus, the air pollution diseases are said to be non-specific. Itai-itai disease is semi-specific to cadmium poisoning.

The use of statistical probability using epidemiological data and a rebut-

table presumption of causation are especially important for the non-specific diseases. The council said, "Each applicant for benefits under the compensation system must show the causal relation between a pollutant and his disease. This task is not difficult for diseases with specific causes, but for diseases with non-specific causes, such as obstructive pulmonary disease, the task is difficult. Thus, in order to have a system which also addresses non-specific diseases, the following presumption should be instituted: an individual will be presumed to meet the causation requirement if he can show an epidemiological causal relation between air pollution and the population group in the area. Thus, an individual need only meet three tests with respect to designated area, term of exposure, and designated disease. He will then be presumed to meet the causation requirement, unless there are special reasons which disprove causation for the individual applicant."[55]

In the course of arriving at the above formulation on causation, medical experts in the fields of pathology, experimental medicine, clinical medicine, and epidemiology often failed to agree on an approach. Nevertheless, lawyers argued that a complete consensus on the scientific evidence was unnecessary in view of the fact that the available evidence was limited. Lawyers asserted that, as long as the available evidence was considerable, the causation question could be resolved by resorting to principles of equity, unless there were specific reasons for objection. The court's opinion in the Yokkaichi case provided a crucial precedent for the compensation legislation.

(iii) Benefits. The council recommended the following seven categories of benefits: a medical treatment allowance (hospitalization and out-patient expenses), a disability allowance, a nurse allowance, a child victim allowance, a medical care allowance (miscellaneous and transportation expenses), a survivors' allowance, and a funeral allowance.

The most controversial of these was the disability allowance. The plaintiffs in the Yokkaichi and the two Minamata cases did not seek compensation for disability because of the difficulty of calculating lost future income and assessing life expectancy. Nevertheless, the Yokkaichi court sought to assess individual income losses by resorting to a standard scale of average wages differentiated by age and gender. The council adopted this approach, but recommended a disability allowance pegged at 80% of the Yokkaichi levels, to be paid monthly. Industry favored a lower rate, and the 80% level was considered an acceptable compromise. By comparison, workmen's compensation provides disability benefits at 60% of the employee's former wages, and the Automobile Accidents Compensation Law provides 60%-70%. Also, the council thought that 80%, rather than 100%, was justified especially in non-specific, air pollution diseases where there is a natural level of prevalence and incidence not caused by air pollution.[56]

For the medical care allowance, the council recommended a standardized table of reimbursable fees which doctors could charge. These fees are higher than the fees set under national health insurance. The council adopted the higher fees based upon a study conducted by the Japan Medical Association as authorized by the 1969 Special Relief Law. The study found that doctors spend more time with patients who are pollution victims due to the special problems related to their diseases.

In addition to the seven benefit categories, the council recommended the institution of health and welfare programs for victims. Under these programs, administrators would establish rehabilitation facilities in rural, unpolluted areas, assist in relocation, and help with the daily problems of victims. Each prefecture was to design a program suitable for local needs.

(iv) Financing compensation. The council's operating principle was that pollutors should finance the compensation program in proportion to their degree of contribution to pollution. Also, the mechanism for collection should be feasible, efficient, and well-managed.

To finance the air pollution part of the program (the so-called Class I diseases), the council studied two revenue methods for charging factories that emit pollutants--the fuel charge and the pollution-load levy. The fuel charge was a tax on the volume of fuel used by a factory. In the end, the council recommended the pollution-load levy--a tax on a factory's emissions of sulfur oxides. First, data presented at the Yokkaichi trial and independent government research indicated that sulfur dioxide was the principal cause of the victims' maladies. Second, sulfur oxides emissions could be easily calculated without having to make actual smokestack-top measurements, because these emissions are directly proportional to the percentage of sulfur in industrial fuel, the rate at which the fuel is burned, and the amount of stack-gas desulfurization that takes place. Finally, because the government possessed adequate data on industrial fuel consumption, sulfur oxides emissions could be monitored easily.[57]

Having a monitoring capability was important because the system relied on the accurate, self-reporting by industry.

The council further recommended that the amount of the pollution-load levy should be set to cover all estimated expenditures for benefit programs in the coming year. Each factory pays according to a graduated scale that takes into account several factors, including the amount of sulfur dioxide emitted from its stacks and the location of the factory. The council advised that the Compensation Law charter a quasi-public agency, the Pollution-Related Health Damage Compensation Association, to collect and disburse the funds.[58]

In addition, the council suggested that emission charges might replace direct regulation of emissions. It was thought that the charges would be an

incentive for factories to install desulfurization equipment or switch to less-polluting fuels. However, this proposal was abandoned, and the program was labeled an emergency relief measure, not a new regulatory scheme.

Factories are not the only source of air pollution. Automobiles and other mobile sources contribute about 20% of Japan's total sulfur oxide and nitrogen oxides emissions. Thus, the council recommended that 20% of the program be financed by automobile owners. The council recommended that the Environment Agency select either a fuel tax or a vehicle tonnage tax. Administrators eventually selected the tonnage tax on the ground that collection costs would be minimized. At that time, there were more than 20 million vehicles in Japan. Also, vehicle owners already paid a tonnage tax, so it was an easy matter to reallocate part of the proceeds of the tonnage tax already being collected by the central government for purposes other than compensation.[59]

To finance the water pollution part of the program (Class II diseases), the council recommended a special levy on the four responsible companies, which would compensate victims directly. These companies were Chisso Corporation (Kumamoto and Kagoshima Minamata disease), Showa Denko (Niigata Minamata disease), Mitsui Mining Company (Toyama itai-itai disease), and Sumitomo Kinzoku (Shimane and Miyazaki chronic arsenic poisoning).

(v) Grievances. Finally, the council recommended the creation of a new administrative board to hear grievances arising under the Compensation Law. The council did not think it was appropriate for compensation grievances to be handled under the existing Administrative Grievance Examination Law. An applicant for benefits under the Compensation Law may challenge his certification decision, benefit level determination, and other matters. Pollutors may challenge the amount of their pollution-load levy.

6.5.2 The administrative system.

A victim who is certified as having a designated disease arising from his presence in a designated area for a specified length of time is eligible for benefits, and health and welfare programs.

(i) Designated diseases. Currently, the government has designated four air-pollution related diseases: chronic bronchitis, bronchial asthma, asthmatic bronchitis, pulmonary emphysema, and their respective sequelae. In addition, it has designated three water-pollution related diseases: Minamata disease (mercury poisoning), itai-itai disease (cadmium poisoning), and chronic arsenic poisoning.

Article 2 of the Compensation Law directs the prime minister to designate pollution diseases after consulting with the Central Advisory Council on Environmental Pollution Control Measures and the governors and mayors of the concerned prefectures and municipalities. Only diseases occurring in connection

with air- and water-pollution may be designated under the Compensation Law. The other categories of pollution defined in the 1967 Basic Law for Environmental Pollution Control Measures--noise, vibration, ground subsidence, and offensive

TABLE 6.2

Designated diseases, designated areas, and certified patients under the pollution-related health damage compensation law, December 31, 1984

Category of Designation	Designated Disease	Designated Area	Local Government in Charge	Year Designated	Certified Patients
Class I	Chronic Bronchitis	Chiba	1	1974	755
Non-Specific Respiratory Disease	Bronchial Asthma	Tokyo	19	1974, 1975	35,229
		Yokohama	1	1974	934
		Kawasaki	1	1969, 1972, 1974	3,313
		Fuji	1	1974, 1977	895
		Nagoya, Tokai	2	1973, 1975 1978	5,873
		Yokkaichi, Kusu	2	1969, 1974	879 87
		Osaka	7	1969, 1974, 1975, 1977, 1978	31,078
		Kobe	1	1977	1,881
		Amagasaki	1	1970, 1974	5,288
		Okayama	2	1975	2,341
		Kitakyushu	1	1973	1,789
		Oomuta	1	1973	1,323
	Subtotal		40		91,665
Class II Specific Disease	Minamata Disease	Agano River, Niigata	2	1969	539
	Itaiitai Disease	Jintsu River, Toyama	1	1969	32
	Minamata Disease	Minamata Bay, Kumamoto	1	1969	1,086
		Kagoshima	1	1969	299
	Chronic Arsenic Poisoning	Sasagatani, Shimane	1	1974	9
		Toroku, Miyazaki	1	1973	102
	Subtotal		7		2,067
Grand Total					93,732

Source: Annual Report on the State of Environmental Pollution, 1984FY

odours--are not covered by the compensation scheme.

(ii) Designated areas. There are two types of designated area--Class I and Class II areas. In order for an area to receive Class I designation, the Cabinet must find that marked air pollution has arisen and that non-specific diseases due to the effects of such air pollution are prevalent. In Class II areas, a specific disease must be prevalent. Table 6.2 describes the present state of designated diseases and designated areas.

There is a two-step process for designating a Class I area. First, scientists measure the concentration of sulfur oxides in the proposed area to be designated. Second, health officials conduct a survey of health effects among the residents of the area.

There are several reasons why sulfur oxides are used as the measure of air pollution. While it is known that nitrogen dioxide as well as sulfur dioxide cause major health hazards in air-pollution related illnesses, by 1970, studies indicated a correlation between the concentration of sulfur dioxide and the prevalence of chronic bronchitis. Also, in 1972, the Yokkaichi court described the degree of air pollution in terms of sulfur dioxide. It noted a correlation between the concentration of sulfur dioxide and the prevalence and incidence of chronic bronchitis and asthma. Finally, the government had a well-documented, ten-year emission history of sulfur dioxide levels, suspended particulates, and deposit gauges, but very little on nitrogen dioxide. Thus, sulfur dioxide was selected as the measure of air pollution.[60]

The recommendations of the Central Advisory Council on Environmental Pollution Control Measures identify four gradations of sulfur dioxide concentrations based on a yearly average monitoring sample. These are: first grade, under 0.04 ppm; second grade, 0.04-0.05 ppm; third grade, 0.05-0.07 ppm; and fourth grade, over 0.07 ppm. Table 6.3 sets forth the gradations. If an area has a

TABLE 6.3

Gradation of air pollution by sulfur dioxide concentration for purposes of compensation area designation

Grade of Air Pollution	Ambient Concentration of SO_2 Measured by Electroconductivity Method	
	Annual Average	ppm
First Grade	0.02	0.04
Second Grade	0.04	0.05
Third Grade	0.05	0.07
Fourth Grade	0.07	

Source: Report of the Central Advisory Council for Environmental Pollution Control Measures, 1973

ten-year history of air pollution levels at the second, third, or fourth gradation, the analysis proceeds to the next step.

The second step in the area designation process is a health effects survey developed by the British Medical Research Council (BMRC). Medical officials interview area residents and ask them questions about their health, specifically regarding persistent coughing and phlegm. Officials also considered examining national health insurance records for this purpose, but they adopted the BMRC survey because data using the survey had already been collected by 1973.[61]

The past surveys provided a benchmark for natural incidence and prevalence rates. For example, the natural incidence of pulmonary emphysema for a forty-year-old man might be one in one hundred. Using this data, administrators can detect how far an area diverges from the natural incidence and prevalence rates. The regulations specify three gradations: first grade, twice the natural rate; second grade, two to three times the natural rate; and third grade, four to five times the natural rate.[62]

Table 6.4 sets forth these gradations.

In deciding whether to designate an area, the Environment Agency then looks at the pollution and disease gradations obtained from the two steps. An area recording a third or fourth grade sulfur dioxide level and a second or third grade chronic bronchitis prevalence rate is quickly designated. Areas receiving low scores are excluded. Also, when the pollution and disease levels in a designated area drop below the set criteria, designation for that area is withdrawn.[63]

This is how the administrative practice under the Compensation Law uses statistical probability to create a rebuttable presumption of causation. In determining the pollutant-disease nexus, the system operates on lesser levels of certainty than scientific discipline would normally require. However, given the dire need to do something about the suffering of pollution victims in 1973, equitable principles won the day.

TABLE 6.4

Gradation of the prevalence rate of chronic bronchitis symptoms as measured subjectively by the BMRC questionnaire method

Grade of Prevalence Rate	Base rate is the Natural Prevalence Rate for 40-50 year olds
First Grade	About Two Times
Second Grade	About Two to Three Times
Third Grade	About Four to Five Times

Source: Report of the Central Advisory Council for Environmental Pollution Control Measures, 1973

One final note on designation. At the time the Compensation Law took effect on 1 September 1974, there were twelve areas designated and 14,355 patients certified under the 1969 Special Relief Law for Pollution-Related Health Hazards. These areas, corresponding to Class I areas under the Compensation Law, were located in twelve cities lying in eight prefectures. These areas and patients were redesignated and recertified, respectively, under the new Compensation Law. Class II areas and patients were similarly transferred.

(iii) Term of exposure. Once an area is designated, a victim seeking certification must meet requirements regarding term of exposure in the designated area. For example, a patient with pulmonary emphysema must show that he continuously lived, worked, or was otherwise present in a designated area for a term of three years, or, if his presence was not continuous, he must show cumulative presence of four-and-a-half years during a term of five-and-a-half years. The required term of exposure differs by disease and age. Table 6.5 summarizes the rules.

(iv) Certification procedures. Article 44 of the Compensation Law requires a prefectural or municipal government with a designated area to establish a Pollution-Related Health Damage Certification Committee. The Certification Committee is composed of ten doctors and five lawyers expert in pollution health matters. A victim who seeks benefits under the Compensation Law files

TABLE 6.5

Required terms of exposure for class I diseases

Designated Diseases	Continuous Exposure	Frame Period for Interrupted Exposure	Cumulated Term of Exposure for an Interrupted Case
Chronic Bronchitis and its sequelae	2 years (1 year for a person under 6 years old)	4 years (2 years and 6 months for a person under 6 years old)	3 years (1 year and 6 months for a person under 6 years old)
Bronchial Asthma and its sequelae	1 year (6 months for a person under 6 years old)	2 years and 6 months	1 year and 6 months (9 months for a person under a year old)
Asthmatic Bronchitis and its sequelae	1 year (6 months for a person under a year old)	2 years and 6 months	1 year and 6 months (9 months for a person under a year old)
Pulmonary Emphysema and its sequelae	3 years	5 years and 6 months	4 years and 6 months

Note: Article 2-1, Cabinet Order, based on Article 4-1-1, Pollution-Related Health Damage Compensation Law

an application and a report of a physician's diagnosis with the Certification Committee. The committee determines whether the applicant is eligible for certification, and if so, it evaluates the degree of the applicant's disability. This is necessary because the amount of the disability benefit varies with the severity of the patient's disability. At this time, the committee also determines the term of the patient's certification. For cases where the disability is irreversible, the certification is permanent; otherwise, it is temporary. However, certification can be renewed if the patient continues to suffer from his illness. Certification is retroactive to the date the application was filed.

(v) Benefits. The Compensation Law provides the following seven categories of benefits: a medical treatment allowance (hospitalization and out-patient expenses), a disability allowance, a nurse allowance, a child victim allowance, a medical care allowance (miscellaneous and transportation expenses), a survivors' allowance, and a funeral allowance.

The medical treatment allowance covers the entire amount of medical bills including the portion otherwise paid under national health insurance. The fees which physicians may charge are fixed.

The disability benefit is calculated by a standard monthly wage scale classified by age and gender with a factor for disability severity. As recommended by the Central Adevisory Council on Environmental Pollution Control Measures, the formula used to derive the table was 80% of the national average wage levels. The disability benefits in effect in Fiscal Year 1985 are set forth in Table 6.6. However, in setting the amount of benefits for a particular applicant, etiology factors unrelated to pollution may be considered.

TABLE 6.6

Standard scale of monthly disability allowance, FY 1985

Age Bracket	Sex	
	Male	Female
15 - 17	84.0	78.1
18 - 19	109.4	93.0
20 - 24	133.3	108.0
25 - 29	167.6	122.6
30 - 34	204.7	125.3
35 - 39	233.5	124.2
40 - 44	253.0	121.3
45 - 49	258.0	119.5
50 - 54	251.2	124.0
55 - 59	216.6	126.3
60 - 64	172.8	117.7
65 -	158.1	113.8

Source: Article 26, Pollution-Related Health Damage Compensation Law

Under the system, there are four degrees of disability, and a factor is assigned to each degree to calculate the amount of the disability allowance. See Table 6.7. Patients with a special grade classification receive an additional allowance for the services of a nurse. In Fiscal Year 1985, the nurse allowance was ¥36,500. The system of classifying a disability into four grades also applies to Class II diseases.

There is a child victim allowance. It is available for all four grades of disability in Class I, and for the congenital Minamata disease in Class II. In Fiscal Year 1985, the amount of the child compensation allowance was as follows: ¥52,700 for the special and first grades, ¥26,400 for the second grade, and ¥15,800 for the third grade.

The medical care allowance covers miscellaneous expenses for hospitalized patients and transportation expenses for out-patients. Table 6.8 sets forth the amounts.

The survivors' allowance is intended to compensate for damages and also to contribute to family life. The benefit provides monthly payments for a period of ten years after the patient's death to certain close family members. Table 6.9 sets forth the monthly survivors' allowance. Where there are no eligible survivors, a lump sum is paid to other survivors more distantly related to the deceased. The lump sum is equivalent to 36 times of the monthly allowance.

TABLE 6.7

Classification of grades for the disability benefit

Grade	Criteria & Guides	Factor
Special Grade	No labor capacity and daily life seriously restricted due to physical and mental conditions and under 24-hour nursing care.	1.0
First Grade	No labor capacity or prohibited from working; need for strict restriction of daily life due to physical and mental conditions.	1.0
Second Grade	Labor strictly restricted and daily life considerably limited due to physical and mental conditions.	0.5
Third Grade	Labor and daily life restricted due to physical and mental conditions.	0.3

Note: Article 10 of Cabinet Order, based on Article 26 of Pollution-Related Health Damage Compensation Law

TABLE 6.8

Medical care allowance, FY 1985

Classification	Conditions	Amount of Allowance
Hospitalized Patient	More than 15 days	28,500 Yen
	8 days to 14 days	26,500 Yen
	Less than 7 days	20,200 Yen
Out-Patient	15 days for class I area More than 8 days for class II	20,200 Yen
	4 days to 14 days for class I 2 days to 7 days for class II	18,200 Yen

Source: Article 40, The Pollution-Related Health Damage Compensation Law

The funeral allowance is allocated to the person who pays the victim's funeral expenses. The amount of the allowance in Fiscal Year 1985 was ¥466,000.

During each fiscal year, the Central Advisory Council for Environmental Pollution Control Measures reviews all the standard scales and revises them if warranted. This includes the disability allowance, child victim allowance, medical care allowance, and survivors' allowance. Also, a prefectural governor

TABLE 6.9

Monthly survivors' allowance, FY 1985

Age Bracket	Sex	
	Male	Female
0 - 14	56.3	56.3
15 - 17	73.5	68.3
18 - 19	95.7	81.3
20 - 24	116.7	94.5
25 - 29	146.6	107.3
30 - 34	179.2	109.7
35 - 39	204.3	108.6
40 - 44	221.4	106.1
45 - 49	225.8	104.5
50 - 54	219.8	108.5
55 - 59	189.5	110.5
60 - 64	151.2	103.0
65 -	138.3	99.5

Source: Article 17, Cabinet Order, based on Article 31, Pollution-Related Health Damage Compensation Law.

may suspend benefits in full or in part where a certified patient or the guardian of a certified child patient fails to follow a doctor's medical orders.

In addition to benefits, the Compensation Law requires the governor of a prefecture having a designated area to provide health and welfare programs. There are five such programs: (i) rehabilitation, (ii) patient relocation for medical treatment, (iii) equipment supply for home patient care, (iv) supervision and guidance for home patient care, and (v) other programs as necessary and appropriate for the promotion of the health and welfare of designated patients and to prevent the exacerbation of their diseases. These programs are based on the traditional duty of local governments to protect and promote the health and welfare of the residents in their jurisdictions.

(vi) Interaction between the Compensation Law, national health insurance, and workmen's compensation. These three statutes, and others, are independent programs. A victim of a pollution disease may select one, but only one, program in which to pursue his relief. Article 14 of the Compensation Law prevents double compensation where an applicant has already received relief under another law, including national health insurance, workmen's compensation, and 24 other programs designated by Cabinet Order. Similarly, Article 13 prevents double compensation by the same person for the same injury under two or more separate provisions of the Compensation Law. In addition, a successful litigant who has received damages in a pollution trial is ineligible to receive benefits under the Compensation Law. However, litigants may participate in health and welfare programs under the Compensation Law.

(vii) Finances. Fig. 6.2 and Table 6.10 together present the complete picture of the relevant institutions and the money flows between them. Prefectural and municipal governments with designated areas make the actual payment of disability benefits to victims and medical institutions treating victims. These local governments receive a subsidy from the national government for the administrative expenses incurred in connection with making such disbursements. This subsidy covers 50% of the total cost of the administrative expenses (Fig. 6.2, line D); the respective prefectural or municipal government covers the remaining 50%.

The Pollution-Related Health Damage Compensation Association is a quasi-governmental organization established to collect funds from pollutors. The association subcontracts the actual collection activity to local chambers of commerce, which charge a fee for their services. This fee and the association's other administrative expenses are paid by contributions from the national government and pollutors (Table 6.10, line 4). The association drafts its principal officers from industry, and industry (particularly Keidanren) manages its daily affairs under the guidance of the Environment Agency and the Ministry

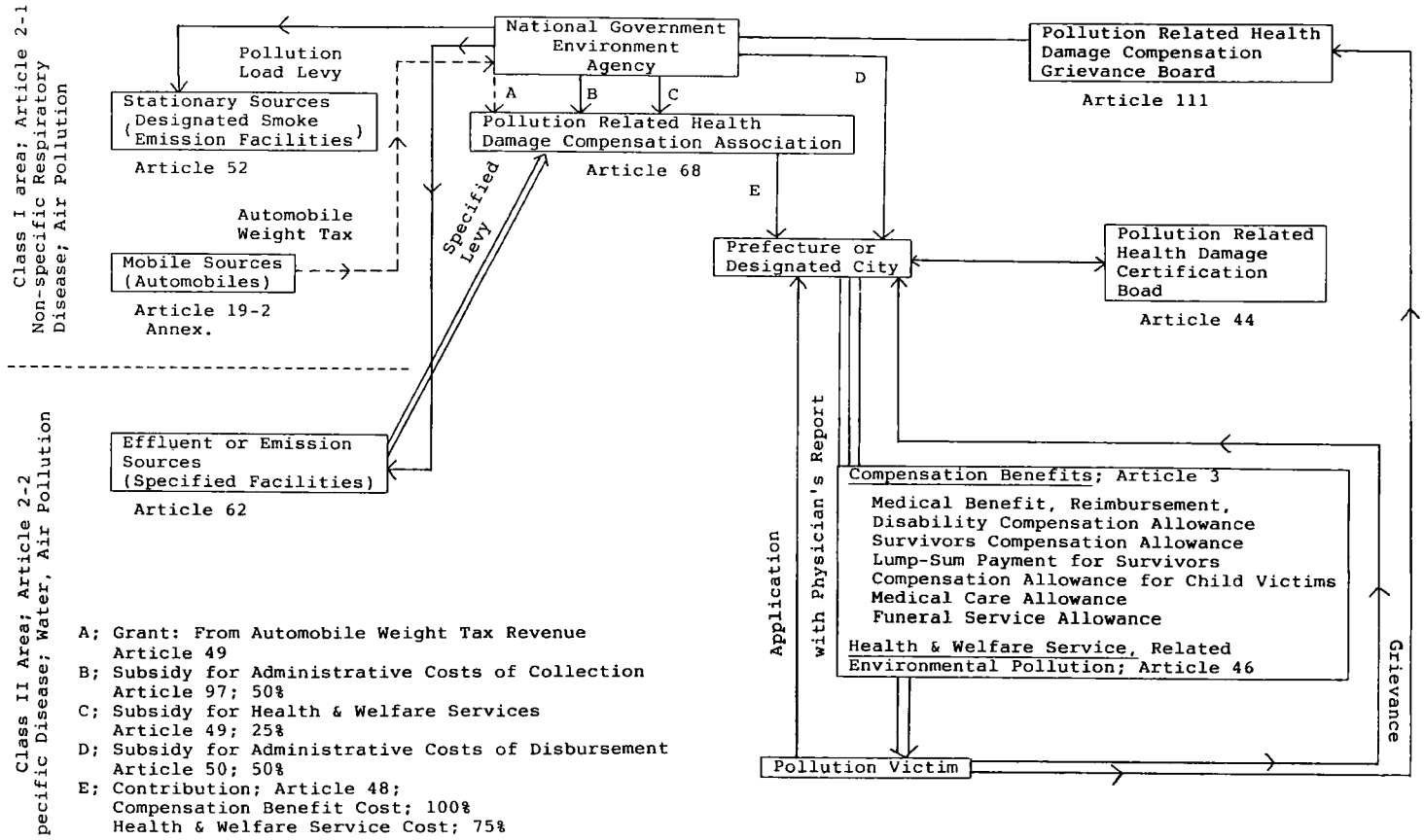

Fig. 6.2. Flowchart for the pollution-related health damage compensation.

TABLE 6.10

Source of finances under the pollution-related health damage compensation law

	Class I Areas Non-specific Respiratory Diseases		Class II Areas Specific Diseases	
Expenditures for Compensation Benefits	Pollution-Load Levy	80%	Specified Levy	100%
	Automobile Tonnage Tax	20%		
Expenditures for Pollution-Related Health & Welfare Programs	Pollution-Load Levy	40%	Specified Levy	50%
	Automobile Tonnage Tax	10%		
	National Government	25%	National Government	25%
	Prefectural or Municipal Government	25%	Prefectural or Municipal Government	25%
Expenditures for Disbursement	National Government	50%		
	Prefectural or Municipal Government	50%		
Expenditures for Collection	Partial National Subsidy			
	Pollution-Load Levy and Specified Levy			

Source: Articles 47, 48, 49, 50 and 51 of the Pollution-Related Health Damage Conpensation Law,
Automobile Tonnage Tax is based on Article 19-2 of the Pollution-Related Health Damage Compensation Law.

of International Trade and Industry.

The scheme, then, makes different institutions responsible for the functions of collection (the association) and disbursement (local governments). The architects of the Compensation Law felt that if one entity carried out both functions, a party dissatisfied with an aspect of disbursement (eg. the amount of benefits) might focus an attack on the collection apparatus, thereby undermining the entity's operations.[64]

In fact the scheme has been a success: more than 99% of assessed levies have been collected.

Money flows for Class I (air pollution diseases) and Class II (water pollution diseases) are kept distinct. Class II pollutors are readily identified; currently, there are only four--Chisso Corporation (Kumamoto Minamata disease), Showa Denko (Niigata Minamata disease), Mitsui Mining Company (Toyama itai-itai disease), and Sumitomo Kinzoku (Shimane and Miyazaki chronic arsenic poisoning). Each of these pollutors pays 100% of the cost of the benefit payments made to the victims of its pollution (Table 6.10, line 1). The

Environment Agency notifies each pollutor of the amount of the special levy, and the pollutors pay the victims directly. In addition, Class II pollutors pay 50% of the cost of the Class II health and welfare programs (Table 6.10, line 2). The national government and local government each pay 25% (Chart 6.2, line C; Table 6.10, line 3).

Class I payments are more complex. Stationary sources of air pollution (factories) pay 80% and mobile sources (vehicles) pay 20% of the total cost of the Class I benefit programs (Table 6.10, lines 1 and 2). The government amended the Compensation Law on 31 May 1974 to add the vehicle tonnage tax. Research indicated that about 20% of total sulfur oxides and nitrogen oxides emissions throughout Japan derived from automobiles (see Table 6.11). The vehicle tonnage tax is not levied by the association, but by the national government through the general budget. The government pays the association an amount equivalent to 20% of the budget for Class I benefits (Fig. 6.2, line A; Table 6.10, line 2) and 10% of the Class I health and welfare programs (Fig. 6.2, line A; Table 6.10, line 3). This amount represents only a small fraction of the total tonnage tax collected by the government.

Stationary pollution-emitting facilities pay the remaining 80% of the budget for Class I benefits (Table 6.10, line 1) and 40% of the Class I health and welfare programs (Table 6.10, line 2). This is done in the form of a pollution-load levy. The formula for calculating the amount of each facility's pollution-load levy is the adjusted unit levy (levy per cubic meter of sulfur

TABLE 6.11

Percentage of pollution emissions from stationary and mobile sources

Source Classification	SO_x	NO_x	Total
Stationary Sources; Mining, Manufacturing, Electric Power, Works, and Others	92.4%	64.3%	78.4%
Mobile Sources; Automobiles & Others	7.6%	35.7%	21.6%
Total	100.0%	100.0%	100.0%
Total Emissions	750×10^6 m^3	610×10^6 m^3	136×10^7 m^3

Source: Environment Agency, Department of Environmental Health, 1974

Note: The ratio of emissions from stationary source to mobile sources is 8:2.

dioxide emitted) times the volume of sulfur dioxide emitted by the facility. Thus, a facility can decrease its pollution-load levy by reducing its sulfur dioxide emissions. Despite this effect, the Compensation Law is not meant to be a regulatory statute; other laws regulate the volume of pollution which facilities may emit.

Each fiscal year, the Environment Agency calculates the amount of the unit levy such that the total proceeds will cover the levy's share (80% and 40%, respectively) of Class I benefits and health and welfare programs. This is provisionally done by dividing the required budget by nationwide emissions. However, two other factors are then taken into account: the 9:1 differential for designated and non-designated areas, and the adjustment to balance revenues and disbursements.

First, some background on the 9:1 differential. The Compensation Law requires all stationary pollutors, whether in designated areas or elsewhere, to pay the pollution-load levy. The only exception is for small pollutors. Small pollutors are defined as facilities emitting less than 5000 cubic meters of sulfur dioxide per hour in designated areas and less than 10,000 cubic meters

TABLE 6.12
Comparison of class I unit levy in effect in FYs 1975, 1977, and 1985

Unit Levy = Yen/SO_x Nm^3

FY / Item / Area	1975 FY	1977 FY			1985 FY	
	Unit Levy	Block	Class	Unit Levy	Class	Unit Levy
Designated Area	77.31 Yen	Osaka	A	536.63 Yen	A	3,318.94 Yen
		Tokyo	B	383,31 Yen	B	2,008.83 Yen
		Nagoya			C	1,834.85 Yen
		Yokkaichi			F	1,310.11 Yen
		Kobe			D	1,746.81 Yen
		Chiba	C	344.98 Yen		
		Fuji			E	1,397.45 Yen
		Fukuoka	D	306.65 Yen	G	1,222.77 Yen
		Okayama				
Non-Designated Area	8.59 Yen			42.59 Yen		194.09 Yen

Source: Guides for Pollution-Related Health Damage Compensation, 1985

per hour in non-designated areas. Small pollutors are excluded because the costs of collection exceed the proceeds. In any event, large pollutors account for more than 90% of sulfur dioxide emitted nationwide so there is a measure of fairness in this. By taxing all large pollutors, the Compensation Law extends the concept of collective responsibility drafted in the Yokkaichi decision. There were only six defendants in the Yokkaichi case, and the court relied on the joint tort statute to assign liability to all of them, even though the emissions of some of the defendants alone might not have been sufficient to cause the plaintiffs' injuries. The provision of the Compensation Law under discussion, however, assigns collective responsibility to thousands of pollutors.[65]

There were about 7,400 Class I pollutors in Japan in the mid-1970s.[66]

To appease those who opposed taxing industries in non-designated areas, a settlement was made whereby the unit levy for a facility within a designated area would be nine times the unit levy for a facility in a non-designated area. The 9:1 ratio is an approximation of the respective concentrations of sulfur dioxide between designated and non-designated areas. The theory is that two facilities--one in a designated area and one in a non-designated area--each emitting the same volume of sulfur dioxide, nevertheless are culpable to different degrees. To release pollutants in an area where there is already a high concentration (annual average ppm of sulfur dioxide) of pollution causes more damage than to release the same volume of pollutants in an area of low pollu-

TABLE 6.13
The pollution-load levy in effect for class I areas in FY 1985

Area	Block	Grade	Factor	Levy Per Unit
Designated Area	Osaka	A	1.90	3,318.94 Yen/Nm^3
	Tokyo	B	1.15	2,008.83 Yen/Nm^3
	Nagoya	C	1.05	1,834.15 Yen/Nm^3
	Yokkaichi	F	0.75	1,310.11 Yen/Nm^3
	Kobe	D	1.00	1,746.81 Yen/Nm^3
	Chiba	D	1.00	same above
	Fuji	E	0.80	1,397.45 Yen/Nm^3
	Fukuoka	G	0.70	1,222.77 Yen/Nm^3
	Okayama	G	0.70	same above
Non-Designated Area				194.09 Yen/Nm^3

Source: Guides for Pollution-Related Health Damage Compensation, 1985

tion concentration.

In any event, the 9:1 differential was introduced in Fiscal Year 1974. Adjusted for the 9:1 differential, the unit levy was ¥15.84 per cubic meter in designated areas and ¥1.76 per cubic meter in non-designated areas. These rates were subsequently raised. FY 1975: ¥77.31/m^3 (designated), ¥8.59/m^3 (non-designated); FY 1976: ¥209.97/m^3 (designated), ¥23.33/m^3 (non-designated). In each case, the unit levy for designated areas is exactly nine times the unit levy for non-designated areas.

A further adjustment to the unit levy is made to balance revenues and disbursements within each designated area. After 1973, revenues and disbursements for each designated area were unbalanced. For example, in the City of Kawasaki, the ratio of revenues to disbursements in 1977 was 0.5:1, whereas in Kobe, the ratio was 2.4:1.[67]

To balance the budget in each designated area, the government transferred excess funds from one area to another where funds were deficient. In time, industry charged that this practice was inefficient, irrational, and unfair. Why, it was asked, should factories in Kobe pay for compensation payments and health and welfare programs in Kawasaki? To reduce interregional transfers, in 1977 the government introduced a system of gradation in the unit levy. A factor was assigned to each designated area ranging from 0.70 to 1.90, and the basic unit levy was multiplied by the area's factor to obtain the adjusted unit levy for that area. Table 6.12 compares the uniform levy in effect in Fiscal Year 1975 with the graduated levies in effect in Fiscal Years 1977 and 1985. Table 6.13 lists the factor and resultant pollution-load levy in effect for selected designated areas in Fiscal Year 1985. As can be calculated from Table 6.12, in Fiscal Year 1985, the Class A unit levy is 2.7 times the Class G unit levy. In Fiscal Year 1985, the unit levy in a Class A designated area is 17.1 times the unit levy in a non-designated area. Table 6.14 lists the relative contributions of the pollution-load levy for designated and non-designated areas in Fiscal Year 1984. The 1736 facilities in designated areas paid 35.9%

TABLE 6.14

The pollution-load levy in designated and non-designated areas in FY 1984

Designation Status	Number of Notification	Amount of Levy (Yen)	%
Designated Areas	1,736	25,156,123 x 10^3	35.9
Non-Designated Areas	6,846	44,903,180 x 10^3	64.1
Total	8,582	70,059,303 x 10^3	100.0

Source: Guides for Pollution-Related Health Damage Compensation, 1985

of total revenues; the 6846 facilities in non-designated areas paid 64.1% of total revenues.

(viii) Grievances. The Compensation Law established an administrative board to hear grievances relating to certification, benefits, or other matters. The Pollution-Related Health Damage Compensation Grievance Board consists of six members appointed by the prime minister with the consent of the Diet. The members should be persons of integrity with experience in law, medicine, or other fields related to compensation for health injury. The board's decision must be unanimous to overturn a previous ruling. A judicial review is available only after the board has issued its final decision. Before a pollutor may file an action in court, he must seek a review of the matter from the Environment Agency and the Ministry of International Trade and Industry.

A different grievance procedure was in effect for complaints under the 1969 Special Relief Law for Pollution-Related Health Hazards. That procedure, set forth in the Administrative Grievance Review Law of 1962, does not apply to grievances under the Compensation Law. Under the 1962 law, the Environment Agency is the body which reviews a decision of a prefectural governor challenged by a complainant. A number of grievances under the 1962 law are still pending. One case, filed by Minamata disease victims, concerns the review of certification decisions.

6.6 PERFORMANCE AND PROBLEMS

6.6.1 Trends in class I areas

Table 6.15 presents the trends in the number of Class I designated areas and certified patients from 1974 to 1984. The Table begins with 12 designated areas in September 1974 because, when the Compensation Law went into effect on 1 September 1974, the twelve areas designated under the 1969 Special Relief Law for Pollution-Related Health Hazards were transferred to the Compensation Law. Table 6.15 shows that the government has designated new areas four times, in November 1974, December 1975, January 1977, and June 1978. In March 1984, there were 49 designated areas in 41 cities, towns, or wards in 10 prefectures, with a total of 89,053 certified patients. On 31 December 1984, the number of certified patients was 91,665.

Table 6.15 shows that the number of active certified patients increased each fiscal year (measured at the end of March) due mostly to the addition of new designated areas. It took about three years for the number of certified patients to peak after the Compensation Law went into effect in 1974. The three-year lag can be attributed to the time it takes for patients, physicians, and others to become informed about the availability of compensation. At the end of March 1981, after a three-year period from the designation of three new areas in June 1978, the rate of annual increase of certified patients dropped

TABLE 6.15

Trends in class I designated areas and certified patients

Year Month	Designated Areas						Certified Patients	
	In number of Prefectures		In number of Cities, Towns, Wards		Designated Areas		Running Total	Annual % Increase
	New	Running Total	New	Running Total	New	Running Total		
1974 Sept.		7		12		12	14,355	
1974 Nov.	2	9	11	23	14	26		
1975 Mar.		9		23		26	19,281	
1975 Dec.	1	10	14	37	16	42		
1976 Mar.		10		37		42	34,184	77.3%
1977 Jan.		10	3	39	4	46		
1977 Mar.		10		39		46	53,414	56.3%
1978 Mar.		10		39		46	63,654	19.2%
1978 Jun.		10	2	41	3	49		
1979 Mar.		10		41		49	72,789	14.4%
1980 Mar.		10		41		49	77,493	6.5%
1981 Mar.		10		41		49	79,963	3.2%
1982 Mar.		10		41		49	83,211	4.1%
1983 Mar.		10		41		49	86,575	4.0%
1984 Mar.		10		41		49	89,053	2.9%

Source: Guides for Pollution-Related Health Damage Compensation; 1985

to 3.2%. From March 1983 to March 1984, the rate of annual increase in the number of certified patients dropped to 2.9%. Table 6.16 presents basic data on Class 1 areas.

TABLE 6.16

Basic data on class I areas

Item of Classification		Figures
Designation	Jurisdiction	40 Local Governments
	Area	1,283 km^2
	Population	12,697 x 10^3
Certification	Application	123,002
	Certification	113,284
	Rate (%)	92.1%
Total Number of Patient	Cured	21,681
	Died	8,431
	Active	83,211

Source: Department of Environmental Health, Environment Agency; (At the end of FY1981) 1982

TABLE 6.17

Trends in sulfur dioxide concentration AT five typical monitoring stations

(unit: ppb)

	Tokyo Chiyoda	Kawasaki Taishi	Yokohama Tsurumi	Yokkaichi Isozu	Osaka NASN
1967	66	100	60	81	91
1968	63	70	50	52	76
1969	54	60	50	51	60
1970	43	52	58	39	56
1971	35	49	45	47	51
1972	23	48	38	20	39
1973	29	40	32	21	26
1974	25	30	25	21	35
1975	27	27	30	10	26
1976	26	24	27	12	26
1977	21	16	22	13	24
1978	19	19	21	13	15
1979	18	16	15	11	14
1980	19	16	13	8	11
1981	16	14	12	10	14
1982	16	12	12	10	13
1983	13	12	13	8	12
1984	12	12	13	10	12

Source: Compiled from annual report of air monitoring results at general (areal) air monitoring station; Ministry of Health & Welfare (1967-1969). Environment Agency (1970-1984)

Table 6.17 shows the trends in air pollution levels measured by the average concentration of sulfur dioxide at five typical monitoring stations in Japan. It can be seen that pollution levels have decreased markedly in recent years. This has been due to a rigorous enforcement program and desulfurization. The government enacted the 1969 Special Relief Law for Pollution-Related Health Hazards shortly after the worst period of air pollution, but it enacted the

TABLE 6.18

Trends in sulfur oxide emission

1976 = 100

Area \ FY	'76	'77	'78	'79	'80	'81	'82
Designated	100	74.5	56.6	39.0	35.6	31.6	26.4
Non-Designated	100	85.9	75.1	67.0	63.6	58.5	52.8
Total	100	84.4	72.5	63.2	59.8	54.8	48.8

Source: Department of Environmental Health, Environment Agency, 1982

TABLE 6.19

Classification of pollution-load levy by amount in FY 1984

Classification by Amount of Levy	Number of Notifications (Running Total)	Amount of Levy (Running Total)	% of Total Yen Amount
¥100 million and over	150	45,099 x 10^6 Yen	64.4%
¥ 10 million to <¥100 million	542	17,157 x 10^6 Yen	88.9%
¥ 1 million to <¥ 10 million	1,941	6,317 x 10^6 Yen	98.0%
¥ 0 to <¥ 1 million	5,781	1,430 x 10^6 Yen	100.0%

Source: Guides for pollution-Related Health Damage Compensation, 1985

Compensation Law at a time of considerable improvement in the level of air pollution. Table 6.18 shows trends in the volume of sulfur oxides emissions by designated and non-designated areas. Emissions decreased in both areas, but much more in designated areas. The large increase in the pollution-load levy after Fiscal Year 1979 apparently acted as an incentive to reduce emissions because the air-pollution-control administration had already regulated emissions in Fiscal Year 1979. Table 6.19 shows the distribution of the pollution-load levy among the range of small and large pollutors in Fiscal Year 1984. Of the 5781 facilities which received notifications for the pollution-load levy, 150 facilities fell in the ¥100 million or more category, and together the facilities in this category paid 64.4% of total revenues. Table 6.19 cumulatively includes this category in the next category (¥10 million to

TABLE 6.20

Trends in the age structure of class I certified patients

Year	0 - 14 Years Old	0 - 5 Years Old	15 - 59 Years Old	More Than 60 Years Old
31 March 1975	47.4%	(20.1%)	27.6%	24.7%
31 March 1976	47.4%	(17.2%)	28.2%	24.4%
31 March 1977	45.6%	(14.9%)	29.6%	24.8%
31 March 1978	44.6%	(13.1%)	30.1%	25.3%
31 March 1979	43.0%	(11.7%)	31.1%	25.9%
31 March 1980	41.7%	(9.9%)	31.8%	26.5%
31 March 1981	40.5%	(8.5%)	32.4%	27.1%
31 March 1982	39.8%	(7.3%)	32.8%	27.4%
31 March 1983	38.8%	(6.5%)	33.7%	27.5%
31 March 1984	37.6%	(6.0%)	34.6%	27.9%

Source: Guides for Pollution-Related Health Damage Compensation, 1985

TABLE 6.21

Trends in the disease structure of class I patients

Year	Chronic Bronchitis	Bronchial Asthma	Asthatic Bronchitis	Pulmanary Emphysema
31 March 1975	24.3%	43.4%	29.0%	3.3%
31 March 1976	22.1%	51.6%	22.5%	3.8%
31 March 1977	21.2%	60.2%	14.7%	4.0%
31 March 1978	20.5%	62.0%	13.6%	3.9%
31 March 1979	20.2%	64.2%	11.9%	3.7%
31 March 1980	19.9%	65.1%	11.4%	3.6%
31 March 1981	19.5%	68.8%	8.0%	3.7%
31 March 1982	19.1%	70.9%	6.5%	3.5%
31 March 1983	18.5%	73.2%	4.9%	3.4%
31 March 1984	18.1%	75.0%	3.5%	3.4%

Source: Guides for Pollution-Related Health Damage Compensation, 1985

less than ¥100 million). The 542 facilities in the top two categories, which comprise 11.97% of the total 5781 facilities, together paid 88.9% of total revenues. In Fiscal Year 1981, pollutors in the electric power, iron and steel, and chemical industries paid about 60% of the total pollution levy.

Table 6.20 represents the trends in the age structure of Class I certified patients from 1975 to 1984. The number of young patients (0-5 years old) has decreased while the number of older patients has increased. Table 6.21 sets forth the trends in the disease structure of Class I certified patients from 1975 to 1984. The incidence of chronic bronchitis has decreased slightly while bronchial asthma has increased. The incidence of asthmatic bronchitis

TABLE 6.22

Trends in the disability grade structure of class I certified patients

Year	Special Grade	First Grade	Second Grade	Third Grade	Others
31 March 1975	0.5%	4.8%	28.1%	44.3%	22.4%
31 March 1976	0.4%	4.2%	28.8%	45.9%	20.7%
31 March 1977	0.3%	3.4%	26.9%	47.9%	21.5%
31 March 1978	0.2%	2.9%	24.7%	48.9%	23.4%
31 March 1979	0.1%	2.3%	22.2%	50.2%	25.2%
31 March 1980	0.1%	1.8%	19.5%	51.2%	27.4%
31 March 1981	0.1%	1.4%	17.9%	52.0%	28.6%
31 March 1982	0.1%	1.2%	16.9%	51.9%	30.0%
31 March 1983	0.0%	1.1%	15.4%	52.3%	31.2%
31 March 1984	0.0%	0.9%	14.6%	52.4%	32.0%

Note: Special Grade (100%), First Grade (100%), Second Grade (50%), Third Grade (30%), Others (No significant disability)
Source: Guides for Pollution-Related Health Damage Compensation, 1985

decreased after March 1980 when medical experts introduced new criteria for certification. The incidence of pulmonary emphysema has remained constant. Table 6.22 presents the trends in the disability grade structure of Class I certified patients. The number of patients in the third grade has increased while the number of patients in the first and second grades has decreased. The number of patients deemed ineligible for the disability allowance due to a lack of disability has increased. However, these patients remain eligible for medical care benefits and the medical treatment allowance under another classification. In general, disease severity has declined and patients are improving.

Table 6.23 presents a comparison of expenditures under the Compensation Law

TABLE 6.23

Comparison of expenditures under the compensation law between FYs 1975 and 1985

unit: 10^6 Yen & %

Budget Item	1975 FY	1985 FY	Increase
I: Compensation Benefits	18,312	95,612	522.13%
1)Medical Care Allowance	6,653	43,607	655.45%
2)Disability Allowance	7,126	30,499	428.00%
3)Survivors Allowance	90	3,246	3606.67%
4)Lump-Sum Survivors Allowance	877	3,170	361.46%
5)Compensation Allowance for Child Victim	1,769	3,474	196.38%
6)Medical Treatment Allowance	1,646	11,121	675.64%
7)Funeral Allowance	151	495	327.81%
II:Pollution-Related Health & Welfare Programs	372	235	63.17%
III:Subtotal, Include Reserve	19,618	98,715	503.19%
IV:Administrative Costs of Collection	435	482	110.80%
Grand Total	20,053	99,197	494.67%

Source of Income — unit: 10^6 Yen & %

I: Pollution-Load Levy	16,129	79,454	492.62%
1)80% of III	15,694	78,972	503.20%
2)IV	435	482	110.80%
II:Grant to the Association for for Pollution-Related Compensation (20% if III)	3,942	19,743	500.84%
Total	20,053	99,197	494.67%

Source: Complied from Report by Department of Environmental Health, Environment Agency 1982 & 1985

between Fiscal Years 1975 and 1985. All items have increased in absolute terms due to the increase in the number of certified patients. However, the relative share of each budget item to the total budget has also changed due to the structural changes in the age, disease, and disability grades of certified patients.

6.6.2 Trends in Class II areas

Table 6.24 presents the state of Class II areas. In Fiscal Year 1984, there were 2067 certified patients in five Class II areas. This does not include the 567 deaths in Kumamoto, the 82 deaths in Kagoshima, and the 200 deaths in Niigata; it does include the 86 deaths from itai-itai disease and the 48 deaths from chronic arsenic poisoning. The five Class II areas in Table 6.24 fall under the jurisdiction of six prefectures and one city. The government has not designated a new Class II area since July 1974.

Under the present state of implementation of the Compensation Law, Class II pollutors pay compensation benefits directly to victims. These are Chisso Corporation (Kumamoto and Kagoshima Minamata disease), Showa Denko (Niigata Minamata disease), Mitsui Mining Company (Toyama itai-itai disease), and Sumitomo Kinzoku (Shimane and Miyazaki chronic arsenic poisoning). Payments are made directly because the Minamata disease victims' organizations objected to receiving payments via the Pollution-Related Health Damage Compensation Association and local governments. Instead, they demanded that Chisso make a lump-sum payment of between ¥16 million and ¥18 million to each victim at the time of certification by the Pollution-Related Health Damage Compensation

TABLE 6.24
Status of class II areas

Designated Disease	Designated Area	Jurisdiction	Date	Number of Certified Patients
Minamata Disease	Agano River Basin	Niigata Prefecture	1969 December	279
		Niigata City		260
Itaiitai Disease	Jintsu River Basin	Toyama Prefecture	1969 December	32
Minamata Disease	Minamata Bay Area	Kumamoto Prefecture	1969 December	1,086
		Kagoshima Prefecture		299
Chronic Arsenic Poisoning	Sasagatani Area	Shimane Prefecture	1974 July	9
	Tohoku Area	Miyazaki Prefecture	1973 February	102
Total	5	7		2,067

Source: Annual Report of Environmental Quality, FY1984

Certification Board. Thus, statistics on the amount of payments made are difficult to acquire.

In addition to the lump-sum compensation payments, Class II pollutors make other direct payments to victims based on judicial awards and extrajudicial mediated settlements. In March 1973, just after the court issued its judgment on the Kumamoto Minamata disease case, T. Kawamoto, the leader of the victim's Self-Negotiation Group, and the president of Chisso had a heated argument, which finally resulted in a mediated settlement. In July 1974, the director general of the Environment Agency gave his support to the settlement.

Since then, there has been a sharp increase in the number of applications for certification of Minamata disease. However, applicants became dissatisfied and annoyed with the national and local governments because of the lack of medical personnel available to examine them. Also, victims complain of the limited capacity of Kumamoto prefecture's Pollution-Related Health Damage Certification Board. In 1974, the Environment Agency recruited medical experts from universities and hospitals to accelerate the medical examination of waiting patients at Minamata. However, victims' groups objected to the program due to difficulties in the doctor-patient relationships, and it collapsed. The situation has improved somewhat since 1977, but capacity remains far below demand. By August 1985, 10,752 people had applied for certification. Of these, the board had certified 1670 cases (15.5%), denied certification for 4030 cases (37.5%), and had postponed decisions on 5052 cases citing difficulty of judgment. Delays in certification procedures became a serious social, political, and administrative issue in Kumamoto prefecture. A number of discontented applicants have filed administrative grievances to challenge denials of certification or inaction due to delay of the certification procedure, and there have been ten civil actions with similar challenges against Kumamoto prefecture and the national government. In one case, a high court upheld part of a patient's claim in connection with a certification decision, and the case is on appeal in the Supreme Court. In addition to taking legal action, Minamata disease victims have engaged in a number of widely publicized instances of civil disobedience.

The judicial and extrajudicial payments which Chisso has made over the years, including expenditures for dredging toxic bottom sediment in Minamata Bay, have put a strain on its financial resources. By March 1984, Chisso had paid ¥71.6 billion to compensate Minamata disease victims and ¥7.4 billion for dredging operations. The company's accumulated deficits have exceeded total assets for more than three consecutive years, and it has failed to pay dividends to stockholders for more than five consecutive years.[68]

In 1979, the government responded to Chisso's near bankruptcy by providing a loan guaranteed in part by the national government. In addition, it estab-

lished the Temporary Minamata Disease Certification Council to expedite the victims' compensation. However, only 98 people applied, and, of these, the Council certified 26 people and denied certification for 71 people.

Victims of chronic arsenic poisoning have also filed court actions. For victims in the Sasagatani area of Shimane prefecture, arranging for the financing of compensation payments proved difficult because of the liquidation of the mining enterprise which caused the injury.

With respect to victims of chronic arsenic poisoning, the Pollution-Related Health Damage Compensation Law has certified patients in the Sasagatani area of Shimane prefecture and the Toroku area of Miyazaki prefecture. Because the owners of the mine works at Sasagatani had liquidated the company prior to the enactment of the Compensation Law, Nihon Kogyo, another mining company, paid a special levy covering 10% of compensation benefits. This calculation was based on the contribution to arsenic pollution by Nihon Kogyo. The Pollution-Related Health Damage Compensation Association has paid the remaining 90% of the compensation benefits to the nine certified patients from the area. This program has been managed outside the usual procedures of the Compensation Law.

In Toroku, the prefectural governor negotiated a settlement between certified patients and the Sumitomo Mine Co. However, the patients were dissatisfied with the settlement. The case is in the High Court. The Pollution-Related Health Damage Compensation Association has collected a special levy in both cases only for the cost of the pollution-related health and welfare programs provided by the local governments.

6.6.3 Leap of faith: science vs. administrative expediency

A major theme in the debate surrounding the enactment of the Compensation Law was the conflict between the dire need to assist the victims of pollution and the need for scientific certainty in determining who would pay for the assistance. This theme can be traced through five issues raised in connection with the Class I aspect of the Compensation Law.

(i) Causation. Each of the four Class I diseases--chronic bronchitis, bronchial asthma, asthmatic bronchitis, and pulmonary emphysema--have multiple etiological factors, air pollution being just one of them. Yet, to have each patient seeking compensation to have to prove that his disease was caused by air pollution would place too great a burden on the victim. It took the plaintiffs in the Yokkaichi case thirteen years to prove their case in court successfully. Under the Compensation Law, victims are relieved of the burden of proving disease causation. This is not to suggest that the issue is ignored. Rather, the administrative practice under the Compensation Law has refined the basic approach to causation developed in the pollution trials into a general methodology for disease, area, term of exposure, and victim designation.[69]

(ii) Area designation. Perhaps more than any other issue, area designation suggests the compromise between scientific uncertainty and administrative expediency. The criteria adopted were elevated sulfur oxides levels and a high prevalence of designated pulmonary diseases as measured by the British Medical Research Council (BMRC) health effects survey. Scientists also conducted a morbidity study based on national health insurance records and a pulmonary function test, but these did not provide consistent data. In formulating the criteria for area designation, the government had the benefit of a number of studies done prior to 1972, but the information was very incomplete. It also drew on its administrative experience with area designation in connection with the 1969 Special Relief Law for Pollution-Related Health Hazards. However, the Special Relief Law did not provide any guidelines for district designation.

Even with elevated pollution levels and a high prevalence of disease, it cannot be said with scientific certainty that the area's pollution caused the disease. The best that can be said is that the pollution contributed to the disease, or that it was a factor in the development of the disease. A related problem is the arbitrary border of a designated area. Air flows freely over the border, yet a person suffering from an air-pollution disease living just outside a designated area is ineligible for compensation.

(iii) Prevalence/incidence. The BMRC measures the prevalence of pulmonary diseases in an area at a given time, but it does not measure the incidence of new cases of the diseases during a given period of time. Data providing a correlation between pollution and incidence would have given more scientific certainty to the process of area designation than merely pollution/prevalence data. But incidence studies are expensive and time-consuming, and they were dropped from the criteria used for area designation.

(iv) Generalizing from Osaka and Yokkaichi. The Mie Medical School, the Osaka Adult Disease Center, prefectural health departments, and the Ministry of Health and Welfare conducted extensive studies on air-pollution levels and health effects in the cities of Osaka and Yokkaichi during the past decade. The studies were valuable because they included epidemiological and clinical data. A number of other epidemiological studies were available for Tokyo and Kanagawa, but they were not continuous and systematic. Also, the air-monitoring data was limited to sulfur dioxide concentration with only weak data on particulates.

With the only good data from Osaka and Yokkaichi, the government used these cities to formulate criteria for area designation applicable to the whole of Japan. This was a case of administrative expediency. Even between Osaka and Yokkaichi, the nature, composition, and pattern of the air pollution and the area's geographical features were completely different. Also, there were differences in the socioeconomic backgrounds of the exposed population. Yet,

it would have been very difficult to gather data and conduct studies in all polluted areas as was done in Osaka and Yokkaichi because a good study takes ten years. Also, retrospective studies were unfeasible.

(v) Transference from the 1969 Law to the 1973 Law. The twelve areas designated under the 1969 Special Relief Law were transferred to the 1973 Compensation Law when the latter became effective. But there was a wide variation in the levels of air pollution and the prevalence of chronic bronchitis in each of the twelve areas. Also, a number of the areas had been hurriedly designated in the milieu of social and political crisis. Some people queried whether a determination should be made to see if each of the 1969 areas met the criteria established under the Compensation Law. However, it was decided simply to transfer all the areas.

6.6.4 The future of area designation

In recent years, pollutors and victims have begun to push for conflicting proposals regarding the future of area designation. Pollutors wish to declassify areas with improved pollution levels while victims wish to add new areas, based on new criteria for nitrogen dioxide pollution.

In support of the proposal to declassify areas, the Keidanren (Federation of Economic Organizations) cites government studies showing that sulfur dioxide levels have declined since 1974 and especially since 1979. In fact, sulfur dioxide levels have declined more rapidly than even the air pollution control administration had expected. Nevertheless, the number of certified patients in absolute terms has continued to increase. The rate of increase did not slow down until 1979. In that year, the Keidanren began a campaign to declassify areas which show a clear improvement in air quality.[70]

The Keidanren does not object to continuing benefits for the group of currently certified patients; it objects to the certification of a new patient who is either born in or comes to a designated area where pollution levels have decreased. The Keidanren urges the revision of exposure requirements and designation criteria and the promulgation of standards for declassification.

Victims admit that sulfur dioxide levels have decreased, but they assert that nitrogen dioxide levels increased until about 1973 when they leveled off. Moreover, nitrogen dioxide levels in roadside areas are much higher than in other areas. In view of the results of experiments on animals regarding the damaging health effects of nitrogen dioxide, victims' groups have proposed that the government include nitrogen dioxide in the standards for Class I area designation. In 1977, the Environment Agency conducted a study on the health effects of nitrogen dioxide pollution in roadside zones, but the results did not produce data sufficient to formulate new criteria for area designation.[71]

However, in 1973, the Environment Agency developed an ambient air quality

standard for nitrogen dioxide, albeit based on scarce scientific information. The agency set the standard at 0.02 ppm/24hrs. Economic and industrial organizations criticized this standard and pointed to the less strict U.S. Clean Air Act in their defense. In 1978, the Central Advisory Council for Environmental Pollution Control Measures issued new criteria and guides for air quality based on three years of systematic data monitoring. The standards set were 0.02-0.03 ppm/year and 0.1-0.2 ppm/hr.[72]

In July 1978, the Environment Agency revised the ambient air-quality standard for nitrogen dioxide to 0.04-0.06 ppm/24hr. Economic and industrial organizations objected that the revised standards were still too strict when compared to U.S. standards.

Groups backed by the mass media have put political pressure on the Environment Agency to expand designation areas based on nitrogen dioxide pollution. These include most of the political parties except for the Liberal Democratic Party, the Bar Association's Committee Against Pollution, and the Environment Conference, a group lead by Professors S. Tsuru and K. Miyamoto. The Environment Conference has requested the government to expand the number of designated areas based on nitrogen dioxide pollution standards, and to improve the health- and welfare-promotion programs.[73]

In this charged context, the Environment Agency has proceeded cautiously. However, in 1983, it requested the Central Advisory Council for Environmental Pollution Control Measures to reexamine proposals for new designation criteria for Class 1 areas. Since this time, medical and public health personnel who are expert in pollution matters have studied designation criteria based on suspended particulates, sulfur dioxide, and nitrogen dioxide. In addition, Professors I. Kato and A. Morishima have made a legal analysis of the Pollution-Related Health Damage Compensation Law, and the legal journal Jurist has published an article addressing critical issues in connection with the compensation system.[74]

6.6.5 The availability of judicial relief

In 1977, the Environment Committee of the Organisation for Economic Co-Operation and Development published a report on the Compensation Law in which it characterized the administrative system as a way to avoid conflict in court. The report said, "In a country where the desire for mutual respect and trust is so great, trials are socially disruptive, and it is not surprising that other ways have been devised to settle conflicts, or rather to suppress them. Thus, in passing the Pollution-Related Health Damage Compensation Law, the Government was not trying to ensure that pollutees would be compensated more quickly, more fully and more surely than they would have been by the courts; the Government was also avoiding open conflicts."[75]

The OECD position is in error. Under the Compensation Law, a person is not barred from seeking judicial review of administrative determinations regarding certification, benefits, or other matters once administrative remedies are exhausted. In fact, from 1975 to 1983, a number of Class I certified patients have filed a total of five actions against private companies, quasi-government corporations, and the national government. Two cases involve industrial pollution--in Chiba in 1975 and in Okayama in 1983. Three cases involve industrial and automobile air pollution in areas adjacent to highways--in Hyogo prefecture in 1976, in Nishi-Yodogawa, Osaka in 1978, and in Kawasaki in 1982. All five cases are still pending. The plaintiffs are contesting an administrative determination of their ineligibility for certain compensation benefits.

Clearly, conflict-avoidance in the courts is not a goal of the Compensation Law because this option remains available and viable. It is true, however, that the Compensation Law may have a pacifying influence on the relationship between pollutors and victims. For example, the five lawsuits have proceeded in a climate of calm and dispassionate debate. The plaintiffs have continued to receive benefits under the Compensation Law, and the defendants have made all required payments and great efforts since 1974 to control their emissions. This is in contrast to the violent climate in which the pollution trials of the early 1970s were conducted.

6.6.6 The amount of benefits

In the 1970s, victims complained that the amount of the disability allowance was too small. This complaint can be attributed to an inappropriate comparison with the amount of damages awarded in the pollution trials. In the trials, the courts did not directly make an award for loss of income because the plaintiffs did not ask for it. (Proving loss of income was too time-consuming and difficult.) Nevertheless, the courts made an award for loss of income under the rubric of mental suffering. The lump-sum awards were quite large compared to the small monthly disability benefit paid to a certified patient under the Compensation Law. However, in time, patients began to realize that, when cumulated, the disability benefits exceed the amount of the Yokkaichi award. Also, the disability benefit, which is based on average nationwide wages, has increased as wage levels have increased. In addition, the government has stressed the importance of the health and welfare programs, largely to counter another patient complaint--the lack of compensation for mental suffering. Although budgets for health and welfare programs have increased, local governments have always spent below budget. This is why the Fiscal Year 1985 budget for pollution-related health and welfare programs was 63.17% of the Fiscal Year 1975 budget. In any event, patients have decreased their complaints regarding the amount and scope of compensation.

In the evaluation of a patient's disability grade or cause of death, patients, families, physicians, and local Certification Councils have agonized over how to account for causes of disability or death unrelated to pollution. It is common knowledge that ageing and smoking are correlated with the incidence, prevalence, and aggravation of obstructive respiratory diseases. The government revised the diagnostic criteria for asthmatic bronchitis in May 1980 in order to exclude other causes of the disease. Since life expectancy is very long in Japan, the Keidanren has requested a review of compensation benefits, such as the survivor's allowance and the disability allowance mostly for people over 65 years of age.

6.6.7 The problems of physicians

In a study conducted under contract from the Environment Agency in March 1984, the Japan Medical Association reviewed the administration of the Compensation Law from the standpoint of the medical profession. There were two main issues: the fee scale for medical care and doctor-patient relations. The study found that doctors needed more time to consult with patients afflicted with pollution-related diseases than with other patients. This fact is seen as justifying the higher fee scale under the Compensation Law than applies under national health insurance. The government modified the fee scale for medical care in 1978 and 1984. From Fiscal Year 1975 to Fiscal Year 1985, total medical expenditures increased 6.5 times. This increase is greater than for other categories of compensation benefits. In addition, the Japan Medical Association report noted the need for a simpler and unified system of fee disbursement to cut down on the paperwork.[76]

The doctor-patient relationship issue centers on the fact that the doctor's diagnosis and recommendations affect the patient's eligibility and grade level for benefits. Doctors also make recommendations for the monthly medical treatment allowance and the survivor's benefit in cases where death is due to pollution-related causes. These are all related to the amount of compensation benefits the patient or his family will receive. These are sensitive issues, especially for members of local medical societies. In many cases the diagnosis is difficult because the symptoms are atypical or onset has been delayed.

6.6.8 The 80:20 ratio

The Keidanren and other industrial groups have attacked the cost allocation between stationary and mobile sources of air pollution. They charge that mobile sources should pay a greater proportion than they do now. Presently, stationary sources pay 80% and mobile sources pay 20% of the cost of providing benefits under the Compensation Law. Administrators arrived at the 80:20 ratio because that is the proportion in which stationary and mobile sources each

contribute to total sulfur oxides and nitrogen oxides pollution. However, this formula assumes that a unit volume each of sulfur oxides and nitrogen oxides contribute to health injury in equal degrees. This has not been demonstrated to be true. In addition, mobile sources contribute more to the actual ground level concentration of nitrogen oxides. At present, the concentration of nitrogen oxides at monitoring stations is much higher than the concentration of sulfur oxides. In the past, the concentration of sulfur dioxide was higher than the concentration of nitrogen dioxide, but this shifted around 1972. In urban areas with many cars and few factories, automobile exhaust contributes about 70% to 80% of the ambient air concentration of nitrogen dioxide. However, there is no evidence to show that the present levels of the ambient air concentration of nitrogen dioxide cause harmful health effects.

Even if the law is changed so that automobile owners pay a greater proportion, there could be administrative problems. Unlike factories, automobile owners do not feel an obligation to pay for pollution damage. They have already been assessed for pollution damage through the automobile tonnage tax, which is a general government tax which existed before a part of it was allocated for compensation. If the tonnage tax is increased, some automobile owners may question their obligation to pay. This is in contrast to a factory which pays a levy based on the specific volume of sulfur dioxide emissions from its plant.

6.6.9 The high collection rate

The Pollution-Related Health Damage Compensation Association successfully collects 99.97% of payable levies. One reason for the high collection rate is that most pollutors are large, financially sound organizations. In Fiscal Year 1984, 8.2% of the notified pollutors from designated and non-designated areas paid 88.9% of the total levy collected. Five types of industries accounted for 78.3% of the total levy collected. These were the electric power, iron and steel, chemical, petroleum and coal products, and paper and pulp industries, in descending order of share. In short, big industries with a large volume of emission pay nearly 80% of the costs of the pollution-related health damage compensation system. Moreover, the association has kept its administrative costs down. In Fiscal Year 1985, it cost ¥482 million to collect ¥99,197 million, which is 0.49%. The cost of collection in Fiscal Year 1985 was only 1.1 times the cost in Fiscal Year 1975.

6.7 CONCLUSION

In general, the Pollution-Related Health Damage Compensation Law has achieved its primary goal of providing fair and timely compensation to victims of pollution. There have, of course, been many problems in the process, in-

cluding the need to resort to a rebuttable presumption of causation. As the adminstration of the Compensation Law continues in its second decade, some old inequities have been eliminated but new ones have appeared in their place.

REFERENCES

1. Kogai Kenko Higai Hosho Ho, 1973 (1973, Law No.111).
2. 1950, Law No. 289.
3. Gresser, J., K. Fujikura and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 41.
4. Law 84 (1972) amending the Water Pollution Control Law, and Law 84 (1972) amending the Air Pollution Control Law.
5. Gresser, J., K. Fujikura and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 44.
6. Gresser, J., K. Fujikura, and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 305, citing data supplied by the Environment Agency.
7. Arima, S., et al. (Eds.): Minamata Disease (Chronological Table), 1979, 841-842.
8. MacAlpine, D. and Araki S. Lancet: 1958, 2, 629-631.
9. Gresser, J., K. Fujikura and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 29.
10. Gresser, J., K. Fujikura and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 87, 88, quoting Watanabe v. Chisso K.K., 696 Hanrei Jiho 15, Hanrei Kogaiho 1641 (Kumamoto Dist. Court, March 20th, 1973), the Kumamoto Minamata disease case.
11. Takeuchi, T., et al.: Kumamoto Medical Journal, 31 (Supplementary 2) (1957), 262 pp.
12. Kitamura, S., et al.: Kumamoto Medical Journal 34 (Supp. 3) (1960) 477 and H. Tokuomi et al., Kumamoto Medical Journal 34 (Supp. 3) (1960) 481.
13. Uchida, M., et al.: Kumamoto Medical Journal, 14(4), 1961, 171.
14. Irukayama, K., et al.: Nisshinigaku, 49(8) 1962, 536 and M. Fujiki, Kumamoto Medical Journal, 37(9), 1963, 494.
15. Shiraki: Science, 1964, 34, 8.
16. Kokyoyo Suiiki no Suishitsu no Hozen ni Kansuru Horitsu (1958, Law No. 181).
17. Harada, M.: Minamata Disease, 1979, 13.
18. Ui, J.: Politics of Environmental Pollution, (Kogai), 1968, 86.
19. Gresser, J., K. Fujikura and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 105 quoting the mimaikin contract.
20. Tsubaki, T.: Minamata Disease, 1979, 293-296.
21. Takizawa, Y., et al.: Journal of the Japan Hygiene Society, 42(10), 1967, 469.
22. Takizawa, Y., et al.: Journal of the Japan Hygiene Society, 42(10), 1967, 475.
23. Arima, S., et al. (Eds.): Minamata Disease, 1979, 868.
24. Arima, S., et al. (Eds.): Minamata Disease, 1979, 870 and T. Kitagawa, Investigation of the Cause of Methylmercury Pollution, 1981, 101-117.
25. Arima, S., et al. (Eds.): Minamata Disease, 1979, 875-876.
26. Kono, M., et al.: Clinical Nutrition, 18(4), 1952, 16-22.
27. Japan Public Health Association: The Report of the Contract Study under the Ministry of Health and Welfare; Environmental Pollution by Trace Heavy Metals, Fiscal Years 1965-1967, 1966-1968.
28. Yoshida, K., et al.: Arch. Env. Health, 13 (1966) 763-768.
29. Yoshida, K., et al.: Journal of the Japan Hygiene Society 22 (1967) 323-335.
30. Yoshida, K., et al.: Japan Journal of Public Health 11 (1964) 1-5.
31. Hashimoto, M.: Kankyo (Environment) 4(6) (1979) 42.

32. Yoshida, K.: 24th Assembly of the Japan Society of Air Pollution, 1983, 67.
33. Ono v. Showa Denko K.K.: 22 Kakyu Minshu (September) 1; Hanrei Jiho (NO. 642) 96; Hanrei Kogaiho 1379 (Niigata Dist. Court, September 29th, 1971); the Agano River-Niigata Minamata Disease case.
34. Watanabe v. Chisso K.K.: 696 Hanrei Jiho 15; Hanrei Kogaiho 1641 (Kumamoto Dist. Court, March 20th, 1973); the Kumamoto Minamata Disease case.
35. Shiono v. Showa Yokkaichi Sekiyu: 672 Hanrei Jiho 30, 280 Hanrei Taimuzu 100; Hanrei Kogaiho, 491 (Tsu Dist. Court, Yokkaichi Branch, July 24th, 1972); the Yokkaichi asthma case.
36. Komatsu v. Mitsui Kinzoku Kogyo K.K.: 22 Kakyu Minshu (Nos. 5 and 6) 1; 635 Hanrei Jiho 17; 264 Hanrei Taimuzu 103; Horitsu Jiho (July 1971) 336; Hanrei Kogaiho 1163 (Toyama Dist. Court, June 30th, 1971), affirmed on Koso appeal, 674 Hanrei Jiho 25; 280 Hanrei Taimuzu 182; Hanrei Kogaiho 1364 (Nagoya High Court., Kanazawa Branch, August 9, 1972); the Itai-Itai Disease case.
37. Gresser, J., K. Fujikura and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 124.
38. Ono v. Showa Denko K.K.: 22 Kakyu Minshu (September) 1; Hanrei Jiho (NO. 642) 96; Hanrei Kogaiho 1379 (Niigata Dist. Court, September 29th, 1971).
39. Gresser, J., K. Fujikura and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 92, quoting the Kumamoto Minamata disease case, Watanabe v. Chisso K.K., 696 Hanrei Jiho 15; Hanrei Kogaiho 1641 (Kumamoto Dist. Court, March 20th, 1973).
40. Yoshida, K.: Jurist 440 (1969) 104-108; K. Yoshida, Jurist (Special Edition) 84 (1972); A. Morishima, Commentary on the Important Court Judgment in 1972, 1973, 61.
41. Gresser, J., K. Fujikura and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 131.
42. Law No. 289, 1950.
43. Kogai Taisaku Kihon Ho (1967, Law No. 132); amended as Law No. 132, 1970; No. 88, 1971; No. 111, 1973; and No. 84, 1974.
44. Hashimoto, M.: Kankyo (Environment) 5(1) (1980) 49-53.
45. Hashimoto, M.: Thinking on Environmental Pollution (Nikkeishinsho 121) 1970, 146-157.
46. Hashimoto, M.: Kankyo (Environment) 5(1) (1980) 55-56.
47. Kogai Ni Kakaru Kenko Higai no Kyusai Ni Kansuru Tokubetsu Sochi Ho (1969, Law No. 90).
48. Government of Japan: White Paper on Environmental Pollution: 1970 Edition, 1971, 240-241.
49. Government of Japan: White Paper on Environmental Pollution: 1970 Edition, 1971, 237-240.
50. Hashimoto, M.: Kankyo (Environment) 5(1) (1980) 56.
51. Kido, K.: The Pollution-Related Health Damage Compensation Law, 1975, 4-6.
52. Kogai Kenko Higai Hosho Ho,1973 (1973, Law No.111).
53. Kido, K.: The Pollution-Related Health Damage Compensation Law, 1975, 422-423.
54. Kido, K.: The Pollution-Related Health Damage Compensation Law, 1975, 8-9.
55. Kido, K.: The Pollution-Related Health Damage Compensation Law, 1975, 424-427.
56. Kido, K.: The Pollution-Related Health Damage Compensation Law, 1975, 428-429.
57. Gresser, H, K. Fujikura and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 298.
58. Kido, K.: The Pollution-Related Health Damage Compensation Law, 1975, 435-436.
59. Kido, K.: The Pollution-Related Health Damage Compensation Law, 1975, 433-436.
60. Environment Agency: Pollution-Related Health Damage Compensation System Study Group, Compilation of Laws, Orders, Regulations, and Rules of the Pollution-Related Health Damage Compensation Law, 1985, 431-437.

61. Environment Agency: Pollution-Related Health Damage Compensation System Study Group, Compilation of Laws, Orders, Regulations, and Rules of the Pollution-Related Health Damage Compensation Law, 1985, 432-436.
62. Gresser, K. Fujikura, and A. Morishima, Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 297.
63. Kido, K.: The Pollution-Related Health Damage Compensation Law, 1975, 426-427.
64. Gresser, J., K. Fujikura and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 299.
65. Gresser, J., K. Fujikura and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 298.
66. Organization For Economic Co-Operation And Development: Environmental Policies in Japan, OECD, Paris, 1977, 47.
67. Gresser, J., K. Fujikura and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 312.
68. Gresser, J., K. Fujikura and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 317.
69. Gresser, J., K. Fujikura and A. Morishima: Environmental Law in Japan, The MIT Press, Cambridge and London, 1981, 290-292.
70. Keizai Dantai Rengokai (Federation of Economic Organizations): Thoughts on the Pollution-Related Health Damage Compensation System, 1979.
71. Environment Agency, Department of Environmental Health: Health Effect Study of Residents in Roadside Zones, 1977.
72. Environment Agency, Air Conservation Bureau: Criteria and Guides for Health Effect by Ambient NO_2 (Compilation of the Recommendations of the Central Advisory Council for Environmental Pollution Control Measures, 1978. The Report of the Expert Committee for Criteria and Guides of Ambient NO_2, March 1978.
73. Awaji, T., et al.: Proposal on the Pollution-Related Health Damage Compensation Law: Interim Report to the Fifth Nippon Kankyo Kaigi (Japan Environment Conference), 1984.
74. Kato, I., M. Hashimoto, A. Morishima and K. Yoshida: "The Problematic Issues of the Pollution-Related Health Damage Compensation Law (Record of Discussion)," Jurist, No.821, September 1984, 6-28.
75. Organisation for Economic Co-Operation and Development: Environmental Policies in Japan, 1977, 48-49.
76. Japan Medical Association: Interim Report of the Environmental Health Committee (Review of Pollution-Related Medical Care System), 1984.