

Vocational Rehabilitation Services' Advisory Council — Terms of Reference

Date: January 22, 1993

1. Background

The Workers' Compensation Board's mission is:

*Workplace safety and health is our challenge.
Quality rehabilitation and fair compensation is our commitment.
World leadership is our goal.*

This mission statement confirms the Board's commitment to providing quality rehabilitation. The establishment of an Advisory Council as mandated in the governors' policy in Chapter XI of the *Rehabilitation Services and Claims Manual* reinforces the Board's commitment to identifying and developing quality vocational rehabilitation programs and policies in consultation with the community.

Through shared ownership and true involvement, the community's role as a key partner in this process will be assured. The Board welcomes input, constructive feedback, and joint investment in improving vocational rehabilitation services and programs.

2. Purpose

Chapter XI of the Vocational Rehabilitation Services policy in the *Rehabilitation Services and Claims Manual* states, "The Vocational Rehabilitation Services Advisory Council facilitates consultation with members of the community served by the Board." This new chapter is to be the foundation of future public consultation and policy review and development. The Advisory Council will play a critical role in identifying and prioritizing issues that the community considers important to the improvement of vocational rehabilitation services and programs.

3. Representative Nature of the Advisory Council

The Vocational Rehabilitation Services Advisory Council will represent community participants in the vocational rehabilitation process at the Workers' Compensation Board. Worker, employer, and vocational rehabilitation public interest will each be represented by three appointed Council members. Representation by persons with disabilities will be a priority. A chairperson will be selected from the public interest members by appointed members of the Advisory Council. Each member will be appointed for a two-year term by the vice-president, Compensation Services Division, after consultation with members of the worker and employer communities. The director of Vocational Rehabilitation Services Department will function as the secretary to the Advisory Council. The vice-president of Compensation Services Division will be an ex-officio member of the Council. The Council will be supported by the Vocational Rehabilitation Services Department.

4. Roles and Functions

Accountability for the delivery of services and for the operation of the Vocational Rehabilitation Services Department remains with the director of Vocational Rehabilitation Services and the vice-president of the Compensation Services Division.

The central function of the Council is to act as an advisory body on matters affecting the delivery of quality vocational rehabilitation to workers in British Columbia. The definition of Quality Rehabilitation (#85.20) and the Principles of Vocational Rehabilitation (#85.30) adopted in Chapter XI establish the set of core values upon which the Department operates and guide the Council's activities within the governors' overall priorities. The Advisory Council is not a policy (governors' responsibility) or decision making (operational responsibility) body.

Specifically, the Advisory Council identifies and prioritizes policy and program issues for discussion and debate within the Council. Recommendations for further research, public debate, internal review and consideration may all be made by the Council and presented to the vice-president, Compensation Services Division. Recommendations will be considered by the vice-president and periodic reports will be provided to the governors outlining issues and recommendations identified by the Council and actions arising from them.

Through individual and collaborative efforts of representative Advisory Council members, the broader community, the resources and mandate of the Vocational Rehabilitation Services Department, and those of the Workers' Compensation Board as a whole, we are committed to delivering equitable and consistent vocational rehabilitation to our community.

5. Meetings of the Advisory Council

Regular meetings will be held on a quarterly basis. Dates will be established by the secretary to the Advisory Council in consultation with Advisory Council members upon the Council's implementation and annually thereafter. It is anticipated that each quarterly meeting will be two days in duration. Meeting agendas will be set by the chair of the Council in consultation with Council members and circulated at least two weeks in advance with supporting materials. Where special task forces are struck, supplementary meetings of these groups will be held as appropriate.

6. Communication

Minutes will be recorded of each Advisory Council meeting and will be presented for review and approval of the Council members prior to distribution. Annually, a summary of the Advisory Council activities and achievements will be produced and distributed.

This policy document setting out the VOCATIONAL REHABILITATION SERVICES ADVISORY COUNCIL TERMS OF REFERENCE was approved by the governors of the Workers' Compensation Board on December 7, 1992, subject to the unanimous approval of final language by the employer, worker and public interest members of the governors' ad hoc Vocational Rehabilitation Committee.

Final language was subsequently approved unanimously by the employer, worker and public interest members of the governors' ad hoc Vocational Rehabilitation Committee.



Governors' Financial Standing Committee First Annual Report

Date: March 1, 1993

Editors' note: This report was prepared by Governor Mark Thompson, chair of the Governors' Financial Standing Committee.

The Governors' Financial Standing Committee ("G.F.S.C.") is mandated to "assist the Governors in fulfilling their oversight responsibilities relating to the insurance, investments, executive compensation, financial reporting, auditing and internal control of the Workers' Compensation Board, while recognizing that the primary responsibility for financial reporting, internal control and compliance with laws, regulations, and ethics by the Workers' Compensation Board rests with the executive management, overseen by the Governors."

The G.F.S.C. was constituted on April 6, 1992 by resolution of the governors pursuant to Section 82(b)(1) of the *Workers Compensation Act* and Section 8 of the governors' Bylaw No. 3 (Board of Governors Procedural Bylaw) — *Workers' Compensation Reporter*, Vol. 7, p. 161. The G.F.S.C. Charter is published in the *Workers' Compensation Reporter*, Vol. 8, p. 131.

The G.F.S.C. evolved from a previous ad hoc governors' committee called the "Audit and Finance Committee." The "Audit and Finance Committee" met for the last time on April 6, 1992, immediately prior to the G.F.S.C. being constituted

The Charter requires that the chair make an annual report of G.F.S.C. "accomplishments and works in progress" each calendar year. This report will cover the activities of the G.F.S.C. from the date of its formal constitution by the governors to the end of 1992.

The Charter also requires that the report review the Charter and make recommendations for any changes perceived necessary.

The Charter has served the G.F.S.C. and governors well in the past year. However, the small membership of the G.F.S.C. combined with the requirement that the worker representative and the employer representative governors and either the public

interest representative governor or the chairman of the governors be present to conduct business caused problems in 1992. The G.F.S.C. will be considering a recommendation to the governors in 1993 that the representative governors be permitted to designate an alternate if unable to attend a particular meeting or, alternatively, the membership of the G.F.S.C. be expanded to include two worker representative and two employer representative governors.

No issues of conflicts of interest or of any other ethical nature concerning G.F.S.C. members arose.

G.F.S.C. Members

The governor members and the duration of their appointments to the G.F.S.C. are as follows:

Worker representative governor — Peter Cameron to July 10, 1992,
Len Werden on a temporary basis from July 13, 1992 to October 26, 1992,
Maureen Whelan from October 27, 1992 to December 3, 1994

Employer representative governor — John St. C. Ross to December 3, 1993

Public interest governor (and chair of the G.F.S.C.) — Mark Thompson to
May 23, 1994

Chairman of the governors — James E. Dorsey to April 30, 1995

The Board's president and chief executive officer, Kenneth M. Dye, participates at G.F.S.C. meetings and support services to the G.F.S.C. are provided by his administrative assistant, Lynne Alsberg.

The Board's vice-president of Financial Services, Bill Evans, and the Board's director of Internal Audit and Evaluation, Tom Hum, attend G.F.S.C. meetings on a regular basis.

Meetings, Reporting and Records

The G.F.S.C. met on five occasions in 1992 — June 1st, August 10th, October 5th, November 25th (a special budget meeting) and December 7th. As required by the G.F.S.C. Charter, minutes of each of the meetings in 1992 were distributed to the governors after approval. Originals are retained in the Office of the Governors.

The chair of the G.F.S.C. also reported orally on G.F.S.C. activities at Board of Governor meetings.

Investments and Investment Performance

The G.F.S.C. Charter requires the G.F.S.C. to review the policies and activities of the Board's Investment Committee.

The Board's Investment Committee along with the Board's fund managers determines, within the policy guidelines adopted by the governors, the current deployment of investment capital to maximize the return. The Investment Committee includes the president and chief executive officer, the vice-presidents of Finance and Information Systems, the Treasurer and two external investment experts.

The Investment Committee meets quarterly. Ministry of Finance officials routinely attend. (Section 67(2) of the *Workers Compensation Act* provides that the Board's investment program is "subject to the supervision and direction of the Minister of Finance.") Minutes of the Investment Committee are provided to the G.F.S.C.

The G.F.S.C. reviewed and discussed the policies and activities of the Board's investment committee on several occasions in 1992. It also considered Quarterly Investment Reports and Investment Performance Measurement Reports prepared by the Board's treasurer.

A major issue considered by the G.F.S.C. in 1992 was investment of Board funds in foreign equities. The Board plans to move approximately 8% of available funds in the investment fund to United States equities and a list of suitable managers has been compiled.

Entry into other foreign equity markets is also being contemplated and the Board is preparing a proposal with respect to specialties, amounts and timetable for the G.F.S.C., the Ministry of Finance and decisions by the Board of Governors. To assist the G.F.S.C. in evaluating entry into foreign equity markets, two investment experts made a presentation at the G.F.S.C. December 7th meeting. The presentation covered financial management, investment policy, capital markets, portfolio diversification, international investing, market timing and risk assessment.

Annual Report/Financial Statements

The G.F.S.C. is required to review the Board's annual financial statements including all significant issues concerning litigation, contingencies, claims and assessments, and all material accounting issues, that require disclosure in the financial statements and the Management's Discussion and Analysis section of the annual report.

The members of the G.F.S.C. reviewed the Board's *1991 Annual Report* and financial statements as the ad hoc "audit and finance committee" prior to the G.F.S.C. being constituted. The members considered that overall the *1991 Annual Report* was well done — very much an improvement over recent years. They decided, however, that the terms in the financial statements should be more clearly explained.

At its December 7th meeting, the president and chief executive officer advised the G.F.S.C. that preparation of the *1992 Annual Report* was on schedule, and that the financial statement format had been revised, after consultation with the community, to reflect the principles of the Association of Workers' Compensation Boards of Canada.

Actuarial

The Charter requires that the G.F.S.C. review the consulting actuary's reports on the assessment rates and the year-end actuarial liabilities.

At its June 1st meeting, the G.F.S.C. met with the Board's external actuary Jack Levi of Ecklar Partners Ltd. to discuss his December 31, 1991 Actuarial Report. Among the issues considered were the transfer of self-insured accounts to rateable classes, mortality assumptions and net rate of return on investments in relation to determining pension liabilities, subclass allocation in assessment rate setting and the projected 1992 accident fund shortfall of \$135 million.

Considerable discussion took place at various meetings in 1992 about changing the Board's discount rate in determining liabilities from its current 2 $\frac{3}{8}$ % to 3%. There was no recommendation to change the present policy, but the issue will be reviewed again in 1993.

Budgetary Variances and Executive Remuneration

The G.F.S.C. Charter requires it to review executive remuneration and benefits. At the G.F.S.C. October 5th meeting, the president and chief executive officer presented the G.F.S.C. with the results of a survey of vice-presidential compensation generally. Based upon the results of that survey, he recommended that vice-presidential remuneration and benefits be restructured. The G.F.S.C. referred the president's recommendations to the Board of Governors. They were accepted by the Board of Governors at the governors' November 2nd meeting.

Risk Management Committee

At its October 5th meeting, the G.F.S.C. approved terms of reference for the Risk Management Committee. The Risk Management Committee will “identify, review and assess areas of potential risk to the Board and its Governors, conduct such investigations as it feels are necessary for those purposes and prepare reports for the President on a periodic basis as he requires.” Areas of concern for the Risk Management Committee include “safety and security of Board premises and operations, insurance coverage, human rights practices and policies, ethics and standards of conduct, financial and legal policies and operations.”

Minutes from the Risk Management Committee meetings will be provided to the G.F.S.C. members. These minutes will assist the G.F.S.C. in carrying out its responsibility to monitor the Board’s program of insurance and to monitor the Board’s compliance with all applicable laws and regulations. The governors as a whole will be kept informed of the Risk Management Committee’s operations through the minutes of the G.F.S.C.

Internal Audit and Evaluation Function

The G.F.S.C. Charter requires it to oversee the Board’s internal audit and evaluation function.

At its August 10th meeting, the G.F.S.C. reviewed and approved the mandate and charter of the Internal Audit and Evaluation Department. The department will audit all areas of the Workers’ Compensation Board, including the Board of Governors. The Charter and the Internal Audit and Evaluation Department Terms of Reference have been published in the *Workers’ Compensation Reporter*, Vol. 8, pages 623 and 627 respectively.)

A number of reports by the Internal Audit and Evaluation Department were forwarded to the G.F.S.C. during 1992. Several issues raised in the reports were discussed. The G.F.S.C. will be considering in 1993 the extent to which major recommendations made in the internal audit reports have been implemented.

External Auditor

The G.F.S.C. Charter requires that it review with the external auditor the proposed scope of the annual examination to determine that management has not imposed any restrictions and that problem areas will receive appropriate attention. It requires that the G.F.S.C. discuss with the external auditor the results of its audit from the preceding year. The G.F.S.C. is also to review the extent to which major recommendations of the external auditors have been implemented.

Section 68 of the *Workers Compensation Act* provides that “the accounts of the board shall be audited by the Auditor General, or by an auditor appointed by the Lieutenant Governor in Council for that purpose and whose salary or remuneration shall be paid by the board.” The accounts of the W.C.B. are audited by the provincial auditor general.

The auditor general, George Morfitt, together with one of his officials, Frank Barr, met with the G.F.S.C. at its August 10th meeting. The G.F.S.C. was advised that the Auditor General’s Office is very supportive of the Board’s financial reporting style. The Board’s financial statements have been clarified over the past few years to conform to generally accepted accounting principles. Successful resolution of concerns about the treatment of special reserves and the way claims costs were expensed occurred this year. Recent audits went extremely well.

1993 Annual Budget

The G.F.S.C. began preliminary discussions regarding the 1993 annual budget at its October 5th meeting. At that time, members were advised by the president and chief executive officer that the Board was within its 1992 budget and that the basis of the 1993 budget would be 0% increase.

A draft Administrative and Capital Budget was presented to the G.F.S.C. by the president and chief executive officer at the G.F.S.C. special budget meeting on November 25th. The draft contemplated a 0% increase over the 1992 budget. The G.F.S.C. then discussed the Board’s priorities during 1993 and how a 0% increase could be achieved.

The G.F.S.C. believed that more effective use of resources should be the Board’s goal. The G.F.S.C. concluded that the projects currently being undertaken by the Compensation Services Division (e.g., the Transition Project) should be finalized, a focus on Occupational Safety and Health should be postponed until new leadership is in place, any services reductions should be to internal rather than external clients, and all legal obligations, e.g., implementation of the *Freedom of Information and Protection of Privacy Act* at the Board, and new regulatory obligations, e.g., the Board’s involvement in the agriculture and fishing industries, should be met expeditiously.

Other Matters

The G.F.S.C. is considering a program evaluation pilot project to determine whether “program evaluation”, i.e., a mechanism for assessing whether programs operated by an organization are delivering value and achieving their objectives, should be instituted at the Board. An initial presentation was made by a consultant at the

G.F.S.C. August 10th meeting. The question of a suitable pilot project will receive further consideration in 1993.

The G.F.S.C. also considered an amendment to the Workers' Compensation Board Superannuation Plan to allow contributions to the Plan after the age 65. Since the Governors have responsibility for policies which impact financially on the Board, the G.F.S.C. decided that the amendment should be placed before the Board of Governors as a whole.

In 1992, the G.F.S.C. also provided a forum in which the president and chief executive officer could present his Quarterly Reports prior to wider dissemination and could discuss his other financial initiatives such as the project among Canadian Boards to produce comparable financial data.

Conclusion

The work of the G.F.S.C. in 1992 necessarily was taken up first with the establishment of policies and procedures for its own operation and its links with managers and internal committees in the Workers' Compensation Board. Management of the Board responded willingly to requests for information and the establishment of new structures to facilitate the work of the G.F.S.C. Necessary policies and procedures were in place by the end of 1992 and were already producing a useful flow of information and decisions on matters within the G.F.S.C. Charter. The G.F.S.C. will be devoting more attention to improving its use of this information.

The most important substantive task of the G.F.S.C. was to assure itself that the financial condition of the Board was sound and that adequate procedures were in place to protect the financial integrity of the Board generally. The results of this examination were generally positive. The auditor general and an independent actuary examined the Board's financial records and approved the reporting procedures, assessments and financial controls. Virtually all of the Board's liabilities are fully funded, and the performance of the Boards' investment portfolio has enabled the Board to maintain one of the country's lowest assessment rates and a generous scale of benefits and services to injured workers. However, the G.F.S.C. noted a trend in 1992 for expenditures to rise faster than income, even including the revenues generated by the reserves in the Accident Fund. This development demands careful monitoring in the future.

Regular reports to the Board of Governors by the chair of the G.F.S.C. proved to be a useful channel of communications with the other governors. At the request of the governors, several policy issues will be analyzed by the G.F.S.C. in 1993.



Index to Classification Committee Minutes**Date: February 10, 1993**

Section 30:20:50 of the *Assessment Policy Manual* makes reference to the Classification Committee of the Assessment Department. It reads as follows:

Not all industries fit into the precise wording in the *Classification and Rate List*. Some judgment decisions have to be made and, within the Assessment Department, these decisions may be referred to an internal committee called the Classification Committee. This committee meets to discuss questionable or disputed classifications. Decisions from the Committee may be documented in Classification Committee Minutes which are distributed to department staff as classification guidelines. The Assessment Department will discuss a decision of the Classification Committee with any affected employer.

The current members of the Classification Committee are:

Director, Assessments	Bud Du Gas
Manager, Assessment Policy	Barney Biggs
Manager, Assessment Services	Roger Piper
Manager, Employer Assessment	Teri Shepherd
Manager, S.D.O.S.	Irv Bell
Manager, Assessment Training	Nadine Kolotyluk
Manager, Registrations	Marilyn Ford

Decisions of the Committee may be documented in Classification Committee Minutes. A copy of any of these minutes is available in the Assessment Department and in every area office of the Workers' Compensation Board of British Columbia.

The following is an index of the current contents of the Classification Committee Minutes.

Reference No.	Title	Date
1.	Indian Bands	November 12, 1975
2.	Prefabricated Steel Buildings	November 17, 1975
3.	Day Care Centre	November 17, 1975
4.	General Policy (Guiding)	November 17, 1975
5.	Fuel Storage Tanks	December 9, 1983
6.	Management Service	November 21, 1975
7.	Sell Newsprint	November 21, 1975
8.	Exterminating	November 21, 1975
9.	General Policy (Proration of Administration; Administration)	November 21, 1975
10.	Distribution of Fliers	November 28, 1975
11.	Industrial Audiometric Testing	March 9, 1979
12.	General Policy (Consulting Forestry)	November 28, 1975
13.	Consulting Forestry	December 5, 1975
14.	Sell Newsprint	December 5, 1975
15.	Sales	December 5, 1975
16.	Painting Signs & Cards	December 19, 1975
17.	Design	December 19, 1975
18.	Summer Camp	December 19, 1975
19.	Wharf Operation	December 19, 1975
20.	Cooling Towers	December 19, 1975
21.	Beachcombing	December 19, 1975
22.	Soil	January 16, 1976
23.	Pilot Car	January 16, 1976

Reference No.	Title	Date
24.	Fish	January 16, 1976
25.	Manufacture Building Products	January 23, 1976
26.	Air Cleaning Equipment	January 23, 1976
27.	Trade Associations	January 23, 1976
28.	Grading Service	January 23, 1976
29.	Unloading Waste Material from Barges	January 23, 1976
30.	Lease and Service	January 30, 1976
31.	Boat Building	January 30, 1976
32.	General Policy (Fishing — Federal Government Charter)	February 10, 1976
33.	General Policy — Amended (Fish Boat Repair; Fishing, Vessel Repair, Boat Building)	November 24, 1978
34.	Sales and Administrative Payroll	February 10, 1976
35.	Shakes	February 10, 1976
36.	Mail Contract	February 10, 1976
37.	Freight Shipping	February 19, 1976
38.	General Policy (Artificial Insemination)	February 19, 1976
39.	Grading Service	February 23, 1976
40.	Ski Instruction	February 23, 1976
41.	Wholesale Meat	February 23, 1976
42.	Welfare Plan	February 23, 1976
43.	Retail	February 23, 1976
44.	Microfilming	February 27, 1976
45.	Construction	February 27, 1976

Reference No.	Title	Date
46.	General Policy (Equipment Allowance)	February 27, 1976
47.	Pneumatic Components Supply & Warehouse	March 8, 1976
48.	Harvesting	March 8, 1976
49.	Marina	March 12, 1976
50.	Thawing Ice	March 12, 1976
51.	Social Service Agency	March 12, 1976
52.	Equipment Sales	March 21, 1976
53.	Automobile Association	March 12, 1976
54.	Musical Entertainment	March 22, 1976
55.	Transcription of Court Proceedings.	March 22, 1976
56.	Valley Printing & Pre-Finishing of Wood Moldings	March 22, 1976
57.	Assembly and Sale of Jet Drive Remote Controlled Ski Tow	March 26, 1976
58.	Manufacture and Sales	March 26, 1976
59.	Buying and Selling of Oil	March 26, 1976
60.	News and Feature Announcing	March 26, 1976
61.	Hamsters & Mice	April 1, 1976
62.	Rock Samples	April 1, 1976
63.	Cooling of Production Tools	May 10, 1976
64.	Logging	May 14, 1976
65.	Employment Relationship	May 14, 1976
66.	Car Racing Team	May 14, 1976
67.	Grading Service	May 20, 1976

Reference No.	Title	Date
68.	Wholesale	May 20, 1976
69.	Lumber Wholesalers	May 20, 1976
70.	Indian Band	May 20, 1976
71.	General Policy (Boat Building; etc.)	May 20, 1976
72.	General Policy (Agent; Public Trustee; Tutors; etc.)	May 28, 1976
73.	General Policy (Amusement Parks; etc. — Amended)	August 5, 1983
74.	Fish Buyer	June 8, 1976
75.	Waterbombers — Loading Chemicals	June 8, 1976
76.	Aircraft Engines	June 8, 1976
77.	General Policy (Fire Extinguishers)	June 8, 1976
78.	Location Broadcast Cut-Ins	June 11, 1976
79.	General Policy (Pilot Car Service)	June 11, 1976
80.	General Policy (Amusement Park; Tourist Attraction)	June 11, 1976
81.	Temporary Construction	June 18, 1976
82.	Community Self Development Society	July 16, 1976
83.	Lumber Wholesale	July 16, 1976
84.	Logging Road Construction	August 6, 1976
85.	Manpower Supply	August 13, 1976
86.	Social Service Agency	August 27, 1976
87.	Transformer Manufacturing	September 1, 1976
88.	Prefinishing Plywood (Amended)	September 3, 1982
89.	Moulding Manufacture (Amended)	September 3, 1982

Reference No.	Title	Date
90.	Clearing Right-Of-Way	September 10, 1976
91.	Industrial Audiometric Testing Services	September 24, 1976
92.	Tailings Dam	October 22, 1976
93.	Electrical Switching Gear	October 22, 1976
94.	Manpower Supply	October 22, 1976
95.	Land Development	October 22, 1976
95(a)	Social Service Agencies	October 22, 1976
96.	Society	October 29, 1976
97.	Consulate General	November 10, 1976
98.	Research and Development	November 19, 1976
99.	Figure Skating Club	November 26, 1976
100.	Social Service Agency	December 3, 1976
101.	Schools — Ski	December 3, 1976
102.	Basketball Camp	December 17, 1976
103.	Social Service Agency	December 17, 1976
104.	Court Reporters (Amended)	June 8, 1984
105.	Music School	January 7, 1977
106.	Door to Door Sales	January 7, 1977
107.	Diving Instruction	January 21, 1977
108.	Equipment Sales	January 28, 1977
109.	Employment Relationship (Taxi Operations)	January 31, 1977
110.	Employment Relationship (Taxi Operations)	January 31, 1977
111.	Machinery Sales	February 11, 1977

Reference No.	Title	Date
112.	Export — Log and Lumber	February 11, 1977
113.	Bird Raising	February 11, 1977
114.	Log Salvage	February 18, 1977
115.	Shipping Services	February 18, 1977
116.	Employment Relationship (Management Company)	February 18, 1977
117.	Physiotherapy and Schools	February 18, 1977
118.	Machinery Sales	February 25, 1977
119.	Consulting Engineering	February 25, 1977
120.	Employment Relationship (Management Company)	February 25, 1977
121.	Industry Codes — Classification	February 25, 1977
122.	Trade School	February 25, 1977
123.	Wilderness Survival School	February 25, 1977
124.	Hockey School	February 25, 1977
125.	Radiator Manufacture	March 4, 1977
126.	Security and Investigative Services	April 1, 1977
127.	Toilet Rentals and Service	April 1, 1977
128.	Publishing and Printing (Amended)	June 2, 1986
129.	Camper Conversion	April 7, 1977
130.	Earth Worm Fair	April 22, 1977
131.	School — Gymnastics	April 22, 1977
132.	School — Hang Glider Instruction (Amended)	July 30, 1991
133.	Trapping	April 22, 1977

Reference No.	Title	Date
134.	Weighing Equipment	April 22, 1977
135.	Indian Operations	April 22, 1977
136.	Steel Wholesale (Amended)	June, 1987
137.	Recreational Vehicles	May 27, 1977
137(a)	Recreational Vehicles	June 3, 1977
138.	Wholesale Meat	June 17, 1977
139.	Coal Mining	June 27, 1977
140.	Camping Tour	July 8, 1977
141.	Central Vacuum Systems	July 8, 1977
142.	Arcade	August 5, 1977
143.	Cleaning of Buildings	August 5, 1977
144.	Inter-Provincial Trucking	January 24, 1984
145.	Co-operative Housing Assn.	August 29, 1977
146.	Gutters — Manufacture and Install	September 14, 1977
147.	Swap Meets (Amended)	August 1, 1984
148.	Aircraft Sales and Service	September 16, 1977
149.	Rental of Appliances or Tools (Amended)	March 23, 1982
150.	Taxidermy	October 6, 1977
151.	Automobile Repair	October 6, 1977
152.	Trout Farms (Amended)	August 29, 1980
153.	Steam Cleaning	October 28, 1977
154.	Hay Sales	October 31, 1977
155.	Greenhouses (Amended)	November 24, 1982

Reference No.	Title	Date
156.	Food Concessions at Carnivals and Fairs	November 23, 1977
157.	Equipment Allowance (Amended)	January 20, 1987
158.	Social Service Agencies	December 8, 1977
159.	Mobile Homes	December 12, 1977
160.	Land Development	December 12, 1977
161.	Consultants (Amended)	April 8, 1980
162.	Drafting	December 16, 1977
163.	Trucking	January 27, 1978
164.	Renovating (Investment Properties)	January 27, 1978
165.	Equipment Allowance	January 27, 1978
166.	Mailing Services	February 10, 1978
167.	Social Service & Health Facilities (Amended)	October, 1992
168.	Bus Transportation (Amended)	November 24, 1978
169.	Fuel Injection Repairs	February 17, 1978
170.	Guitar Manufacture	February 17, 1978
171.	Nursery-Turf (Amended)	July 26, 1978
172.	Logging Road Construction	February 24, 1978
173.	Doctors Office	March 10, 1978
174.	Volunteer Fire Brigades	March 10, 1978
175.	Indian Bands	March 10, 1978
176.	Social Service Agencies	March 10, 1978
177.	Reforestation	April 3, 1978
178.	Music Tape Rental	April 14, 1978

Reference No.	Title	Date
179.	Furniture Rental	April 21, 1978
180.	Material Manufacturing	April 21, 1978
181.	Paper and Glass Recycling Depot	May 8, 1978
182.	Dog Training	May 8, 1978
183.	Paper Recycling Depot	May 19, 1978
184.	Ski Repair	May 19, 1978
185.	Line Painting	May 26, 1978
186.	Microfilming Service (Amended)	February 21, 1986
187.	Sprinkler Systems (Lawn)	June 2, 1978
188.	Manufacturing — Diving Dry Suits	June 2, 1978
189.	Polyfoam Manufacture	June 16, 1978
190.	General Policy (Youth Organizations; Data Processing)	June 30, 1978
191.	Ski Schools	June 30, 1978
192.	Beekeeping	June 30, 1978
193.	Post Office	June 30, 1978
194.	Management Company	August 11, 1978
195.	Proration Payroll (Amended)	December 9, 1983
196.	Salmon Enhancement Programs	August 24, 1978
197.	Aircraft Broker	October 13, 1978
198.	Cone Picking	October 13, 1978
199.	Marine Surveying	October 13, 1978
200.	Archaeological Survey and Research	October 13, 1978
201.	Ski — Slope Preparation	October 20, 1978

Reference No.	Title	Date
202.	Automobile Race Course	October 20, 1978
203.	Sauna Manufacturing and Install	October 20, 1978
204.	Used Automobile Parts	November 24, 1978
205.	Photography (Amended)	October 31, 1991
206.	Building Construction (Personal Use)	January 26, 1979
207.	Seed Cone Processing	January 26, 1979
208.	Furniture Refinishing	January 26, 1979
209.	Tropical Plant Servicing	March 16, 1979
210.	Ski Rental	March 23, 1979
211.	Labour Supply	March 23, 1979
212.	Submarine Cable Installation	March 30, 1979
213.	Temporary Employers	
214.	In-Store Bakery	April 6, 1979
215.	Cottage Winery Industry	June 28, 1984
216.	Pilot Supply	April 6, 1979
217.	Interior Design & Decorating	April 6, 1979
218.	Custom Brokers/Freight Forwarding (Amended)	December 14, 1984
219.	Restaurant Equipment Supply (Amended)	May 6, 1983
220.	Poultry Hatchery (Amended)	May 4, 1983
221.	Food Concessions (Amended)	March 15, 1985
222.	Harvesting of Seafood by Diving	August 8, 1979
223.	Manufacture of Scale Models	August 24, 1979
224.	Inter-Provincial Trucking (Amended)	September 19, 1979

Reference No.	Title	Date
225.	Stock of Goods Maintained in B.C. for Resale (Amended)	November 4, 1983
226.	Shipping Services (Marine) (Amended)	December 13, 1979
227.	Volunteer Firemen	November 30, 1979
228.	Indian Band Operations	December 7, 1979
229.	Ski Resort	December 17, 1979
230.	First Aid Service	January 15, 1980
231.	Realization of Assets	February 5, 1980
232.	Pilot Car	February 29, 1980
233.	Sun-Tan Salon	March 7, 1980
234.	Feed or Farm Supply Dealers (Amended)	September 11, 1980
235.	Consolidated and/or Amended General Policy	May 24, 1985
236.	Multiple Classifications	December 5, 1980
237.	House Sitting Service	May 23, 1980
238.	Electronic Equipment Manufacturing	June 27, 1980
239.	Boat Rental	June 27, 1980
240.	Ancillary Operations to the Air Transport Industry	July 18, 1980
241.	Lumber Re-Manufacturing (Amended)	September 3, 1982
242.	Mud Sales	November 24, 1980
243.	Homemaker Service	December 5, 1980
244.	Tug and Barge Transportation	December 12, 1980
245.	Refining Precious Metals	December 22, 1980

Reference No.	Title	Date
246.	Marble (Amended)	August 27, 1982
247.	Liquor Wholesale (Amended)	January 15, 1982
248.	Apartment Buildings	January 30, 1981
249.	Wholesale Establishment (Amended)	September 21, 1984
250.	Resort Accommodation	February 9, 1981
251.	Export Sales	March 13, 1981
252.	Packaging	March 20, 1981
253.	Satellite Television Dish Install	April 3, 1981
254.	Oilfield Training	April 3, 1981
255.	Information Service	May 29, 1981
256.	Railway Association	June 5, 1981
257.	Log Bands	June 5, 1981
258.	Wood Lot (Amended)	August 31, 1982
259.	Telephone Installation (Amended)	October 26, 1984
260.	Manufacture of Waterbed Mattresses (Amended)	April 16, 1986
261.	Private Telephone System	October 30, 1981
262.	Sand/Gravel Sales	October 30, 1981
263.	Coal Packaging (Amended)	August 31, 1982
264.	Time-Sharing — Yachts/Boats	August 14, 1981
265.	Incorporated Companies & Professionals	August 28, 1981
266.	Health Care Service	November 13, 1981
267.	Farm and Feed Supply	January 22, 1982
268.	Taxi	February 5, 1982

Reference No.	Title	Date
269.	Egg Production, Processing & Distribution (Amended)	June 29, 1984
270.	Pre-Packaged Homes	January 15, 1982
271.	Manufacture of Parking Equipment	February 19, 1982
272.	Consultant	March 16, 1982
273.	Fireplaces	March 26, 1982
274.	Nurseries	March 26, 1982
275.	Fishing Guides (Amended)	March 25, 1983
276.	Service Stations	May 20, 1982
277.	Powder Coating	May 7, 1982
278.	Jade Mining	May 7, 1982
279.	Not designated	
280.	Lumber Wholesale (Amended)	November 9, 1984
281.	Property Management	June 18, 1982
282.	Residential Cleaning (Amended)	January 31, 1983
283.	Automotive Leasing	June 25, 1982
284.	Freight Forwarding (Amended)	November 19, 1982
285.	Logging Management	September 10, 1982
286.	Commercial Fishing	September 17, 1982
287.	Scarification	November 26, 1982
288.	Plating and Coating (Amended)	January 28, 1983
289.	Federal Government Contract	January 7, 1983
290.	Tour Operators	February 14, 1983
291.	Satellite T.V. Dishes (Amended)	February 11, 1983

Reference No.	Title	Date
292.	Contact Lenses and Glasses	February 18, 1983
293.	Manufacture Insulation Board	March 8, 1983
294.	Packaging	March 4, 1983
295.	Garbage Dump	March 4, 1983
296.	Sales and Service Oxygen Inhalators	March 4, 1983
297.	Bakery Products (Amended)	April 16, 1986
298.	Farming	March 18, 1983
298a.	Mixed Farming (Poultry Farming; Cattle Raising)	March 18, 1983
298b.	Mixed Farming (Hay Farming; Poultry Farming; Boarding)	March 18, 1983
298c.	Mixed Farming (Berry Farming; Hay Farming)	March 18, 1983
298d.	Mixed Farming (Orchards; Vineyards)	April 11, 1983
298e.	Nut Farms	April 11, 1983
298f.	Sheep Shearers	October 14, 1983
299.	Graphic Design (Replaced by CCM #360)	June 19, 1987
300.	Personal Service Corporations (Amended)	January 26, 1984
301.	Packing & Crating	March 25, 1983
302.	Multiple Classifications	March 25, 1983
303.	Orchard Covers	April 11, 1983
304.	Irrigation Contracting	April 11, 1983
305.	Fibreglass Automobile Parts	April 11, 1983
306.	Communal Farm	April 22, 1983

Reference No.	Title	Date
307.	Ultra Light Aircraft	May 25, 1983
308.	Horse Bleeding	May 6, 1983
309.	Orchards	May 6, 1983
310.	Horse Breeding (Amended)	May 30, 1983
311.	Church	May 25, 1983
312.	Geophysical Contractors (Amended)	October 1, 1985
313.	Water Delivery	August 5, 1983
314.	Carpet Cleaning	August 5, 1983
315.	Mushroom Picking	August 12, 1983
316.	Plastic Coating of Handrails	September 2, 1983
317.	Manufacture of Floats	September 2, 1983
318.	Manufacture — Needle Art Kits	October 14, 1983
319.	Street Light Installation	October 14, 1983
320.	Employment Relationship	October 28, 1983
321.	Classification Changes	November 7, 1983
322.	Models	November 4, 1983
323.	Data Processing Service	November 18, 1983
324.	Glass Shop (Amended)	January 26, 1984
325.	Multiple Classifications	January 20, 1984
326.	Hay Dealers	January 31, 1984
327.	Computer Tape Storage	May 11, 1984
328.	Electronic & Electrical Definitions (Amended)	September 14, 1984
329.	Lifeguard Service	June 7, 1984

Reference No.	Title	Date
330.	Employment Relationship and Registration Requirement	June 7, 1984
331.	Custom Manufacture (Amended)	October 19, 1984
332.	Festivals	June 22, 1984
333.	Manufacture Aluminum Windows	July 20, 1984
334.	Fire Suppression	August 10, 1984
335.	Medical Profession	August 24, 1984
336.	Brokerage Operations	August 28, 1984
337.	Campground Operation (Amended)	November 21, 1984
338.	Alarm Systems	October 12, 1984
339.	Catering	November 30, 1984
340.	Computer Programming Service vs. Computer Program Manufacturer	December 14, 1984
341.	Lottery Ticket Sales	December 21, 1984
342.	Equipment Sales and Service (Amended)	February 22, 1985
343.	Shipping Industry	January 23, 1985
344.	Creosoting	January 25, 1985
345.	Government Grants (Amended)	March 1, 1985
346.	Mobile Home Sales	February 21, 1985
347.	Oil Field Supervision (Amended)	April 12, 1985
348.	Farming/Logging	May 22, 1985
349.	Contracts	May 22, 1985
349a.	Contract (Industrial Catering)	March 22, 1985
349b.	Contract (Fertilizer Spreading)	March 22, 1985

Reference No.	Title	Date
349c.	Contract (Automotive Painting)	March 22, 1985
349d.	Contract (Automotive Repair Shop)	March 22, 1985
349e.	Contract (Chambermaid Service)	March 22, 1985
349f.	Contract (Fire Management)	March 22, 1985
349g.	Contract (Furniture Manufacture)	March 22, 1985
350.	Regeneration Surveys	May 13, 1985
351.	Multiple Classification	July 23, 1985
352.	Product Distribution (Amended)	October 1, 1985
353.	Building Rental	December 18, 1985
354.	Horse Breeding	December 18, 1985
355.	Kitchen/Bathroom Cabinets (Amended)	October 19, 1990
356.	Manufacture of Articles from Plastic Materials	July 29, 1986
357.	Dog Grooming/Retail (Amended)	December 8, 1986
358.	Veterinary Clinics	December 5, 1986
359.	Swimming Pool Servicing	June 19, 1987
360.	Graphic Design	June 19, 1987
361.	Park Maintenance	April 28, 1988
362.	Compensation	May 3, 1988
363.	Development Phase	July 21, 1988
364.	Log Sales	March 22, 1989
365.	Flyer Delivery	May 12, 1989
366.	Log Sales	May 15, 1989
367.	Log Chipping	March 29, 1990

Reference No.	Title	Date
368.	Special Event Management	November 6, 1990
369.	Mistletoe Eradication	November 16, 1990
370.	Prefabricated Kits — Outbuildings	February 6, 1991
371.	Grain Sales	January 28, 1991
372.	Packaged Office Services	April 4, 1991
373.	Adventure Experiences	July 26, 1991
374.	Diet Counselling	August 28, 1991
375.	International Shipping Companies	June 28, 1991
376.	Manufacture of Electrical Switchgear	October 22, 1991
377.	External Cleaning of Buildings	December 20, 1991
378.	Tar and Gravel Roofing; Flat Top Roofing	March 23, 1992
379.	Operations in Other Provinces	October 14, 1992
380.	Moving Heavy Equipment/Machinery	October 30, 1992
381.	Manufacturing/Sales and Installation	January 15, 1993

Editors' note: This index will be updated in future issues of the Workers' Compensation Reporter.



Industrial Diseases Standing Committee First Annual Report

Date: February 1, 1993

The Industrial Diseases Standing Committee of the governors is mandated to “review the industrial diseases policies of the Workers’ Compensation Board and to make recommendations for change to the Governors.”

The Committee was constituted on April 6, 1992 by resolution of the governors pursuant to Section 82(b)(1) of the *Workers Compensation Act* and Section 8 of the governors’ Bylaw No. 3 (Board of Governors Procedural Bylaw) — *Workers’ Compensation Reporter*, Vol. 7, page 161. The Committee Charter is published in the *Workers’ Compensation Reporter*, Vol. 8, page 135.

The Charter requires that the chair make an annual report of “accomplishments and works in progress” each calendar year. It also requires that the report review the Charter and make recommendations for any changes perceived necessary. The Charter has served the Committee and governors well in the past year and no changes are necessary.

No issues of conflicts of interest or of any other ethical nature concerning Committee members arose.

Committee Members

The governor members and the dates of the expiration of their appointment to the Committee are as follows:

Worker representatives:

Leif Hansen	April 6, 1995
Stanley J. Shewaga	April 6, 1994

Employer representatives:

Robert Hugh Buckley	April 6, 1995
Murray A. Farmer	April 6, 1994

Public interest representative:

Bonnie Hayes April 6, 1994

Chairman:

James E. Dorsey April 30, 1995

Openness

The first responsibility assigned to the Committee under its Charter is to develop and publish an operating protocol. The operating protocol (Bylaw No. 1 of the Industrial Diseases Standing Committee) was approved by the governors on August 10 and is published in the *Workers' Compensation Reporter*, Vol. 8, page 613.

Consistent with the governors' dedication to conducting their affairs and fulfilling their statutory obligations in an open manner, the Committee's operating protocol states that it will operate in "a fashion which is participatory, consultative, open, accessible, comprehensive and fair, with a view to fostering the greatest possible confidence in its recommendations."

Two-year Review

The second responsibility of the Committee is to undertake a comprehensive review of all entries currently in Schedule B and on the list of diseases designated or recognized by the Board by regulation of general application and make recommendations for updating both by April 6, 1994.

The Board has the authority and responsibility under Section 6(4)(a) of the *Workers Compensation Act* to add to or delete from Schedule B to the *Act* and under Section 1 of the *Act* to designate or recognize a disease as an industrial disease by regulation of general application.

These statutory responsibilities will be exercised by the governors. The Committee has obtained a legal opinion on the procedural steps to be taken to amend Schedule B and the list of diseases recognized by regulation.

There are at least 46 diseases, including poisonings, infections, cancers and others, described in Schedule B. The Board has recognized 19 occupational diseases by regulation pursuant to Section 1 of the *Act*.

The Committee began with a review of the diseases listed in Schedule B least frequently compensated between 1987–1991. The Committee has received background information on 21 of them from the Committee’s Secretariat. Regrettably, the experience information that the Committee requested was not as completely available as we would have liked. To supplement what was available within the Board, the Secretariat solicited additional information from management and adjudicators working with disease claims.

The 21 diseases reviewed represent an experience range from zero time loss claims to 68 accepted time loss claims in the five years 1987–1991. Tables and graphs showing some of the experience data are appended.

Priorities: Repetitive Strain Injury

The third responsibility assigned to the Committee is to prioritize the other outstanding occupational disease policy issues as of April 6, 1992 and consider and make recommendations to the governors.

The Secretariat identified and wrote to over 500 persons and organizations outside the Board in July requesting assistance in identifying issues and their priority. It received 57 responses. It also canvassed the interested community within the Board. Responses were received from as many employer as worker representatives, several health care professionals, advocates and government agencies.

The issues identified in order of concern were repetitive strain injury, communicable diseases, health problems not considered to be industrial diseases (e.g., degenerative disc disease, stress and knee disorders), respiratory diseases, heart diseases, cancers and Sections 6(1) and 55 of the *Act*.

The Committee set repetitive strain injuries as its first priority and in November the Secretariat invited detailed submissions from interested persons on this subject. At year end 14 had been received.

Repetitive strain injuries are also known as cumulative trauma disorders, repetitive motion injuries, hand/arm syndrome, wear and tear disorders, myofascial pain syndrome and overuse syndrome/injury. These general terms include the diagnosed conditions tenosynovitis, tendinitis, bursitis, epicondylitis, nerve entrapment syndromes (carpal tunnel, cubital tunnel and radial tunnel syndrome) and hand-arm vibration. Some of these, when occurring in certain described processes, are currently included in Schedule B.

The Committee will examine this issue and expects to make recommendations to the governors in 1993.

Research Standards

In considering occupational disease issues and which diseases should be designated or recognized by general regulation or included in Schedule B for certain processes or industries, it will be necessary for the Committee to review, evaluate and assess the weight to be given to medical/scientific research and other writings that are relied upon to support advocated positions.

The Committee's operating protocol allows the Committee to "establish minimum acceptable methodological standards for any research that the Committee may rely upon in making recommendations."

Following a Committee review of accepted appraisal approaches, the Secretariat engaged Dr. Terence W. Anderson M.A., B.M., B.Ch. Ph.D., C.C.B.O.M., F.R.C.P.C. to draft a protocol for the assessment of medical/scientific information. Dr. Anderson had his draft reviewed by several colleagues. In December the draft was sent for comment to the persons who had responded to the initial July request to identify issues. By year end four responses had been received.

Once adopted in its final terms by the Committee, the protocol will be published in the *Workers' Compensation Reporter*.

Secretariat

The Committee's Charter allows the Committee to establish "a secretariat or like administrative body of W.C.B. personnel to assist the Committee in fulfilling its responsibilities."

Bylaw No. 1 of the Industrial Diseases Standing Committee establishes a Secretariat and sets its role, reporting and staffing. Secretariat members are appointed by the vice-president, Compensation Services. Mr. Len McNeely has appointed Dennis Campbell, claims adjudicator — Special Unit (co-ordinator) and M. Sharon Slobodian (Administrative/Secretarial Support). Special Unit claims adjudicator Bill Brewer assists Mr. Campbell. Assistance from other Board employees will be provided as required.

The Committee is especially indebted to Dennis Campbell for the leadership he has taken in the Secretariat and in support of the Committee's work.

The Secretariat resides in the Special Claims Unit which has primary responsibility for the administration of occupational disease claims. Its current address is as follows:

Industrial Disease Secretariat
Workers' Compensation Board of British Columbia
6951 Westminster Highway
Richmond, B.C. V7C 1C6
Attention: Dennis Campbell
Tel: (604) 279-8103 Fax: (604) 279-7592

Prevention

While the Committee's Charter does not direct the Committee to examine issues of prevention of occupational disease, prevention is a responsibility of the governors and the Committee members are acutely aware of the need to have a primary emphasis on prevention over compensation. They wish their work to be coordinated with Board prevention strategies.

The Committee's operating protocol requires that it ensure that the Board's Occupational Safety and Health Division is consulted on all matters related to the content of the Committee's recommendations. On behalf of the Board's Occupational Health Department, part of the O.S.H. Division, Dr. Joe Nearing has worked closely with the Secretariat and Committee. His counsel and advice were greatly appreciated and respected by the Committee.

The Occupational Health Department is responsible for identifying occupational diseases in B.C., recommending methods for eliminating or reducing incidence and severity and assisting in the accurate assessment and management of occupational disease claims.

On the issue of repetitive strain injuries, the Secretariat has worked closely with the Secretariat for Regulation Review and its Ergonomics Specialty Subcommittee to coordinate the separate claims and prevention focuses of their respective duties.

Reporting and Records

As required by the Committee's Charter and Operating Protocol, minutes of each of the four meetings in 1992 were distributed to the governors once approved. Originals are retained in the Office of the Governors. Copies of the minutes are publicly available from the Secretariat.

The manner of preservation and access to Committee records — correspondence, research papers, position/discussion papers, medical and other opinions, etc. — has been discussed, but not been finally determined. The chair and Committee want to ensure that all rules and procedures fully comply with freedom of information and privacy legislation that will become effective in 1993.

Independent Research

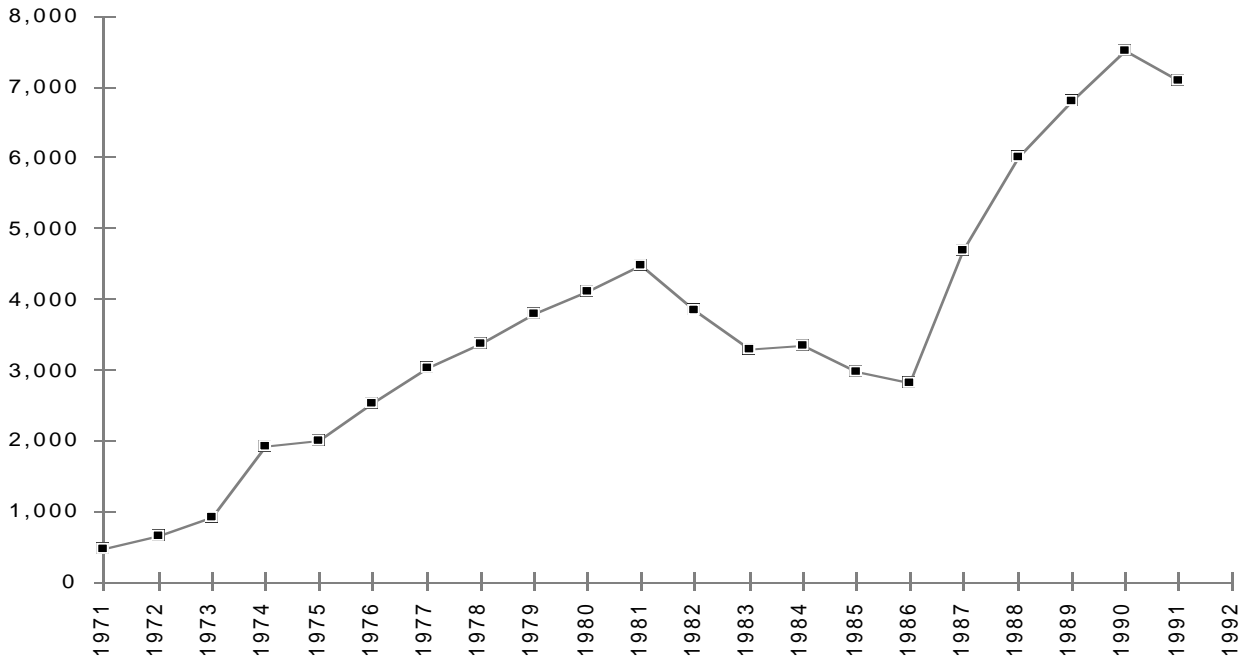
The Committee did not commission any research or other work in 1992 requiring funding approval from the governors.

Conclusion

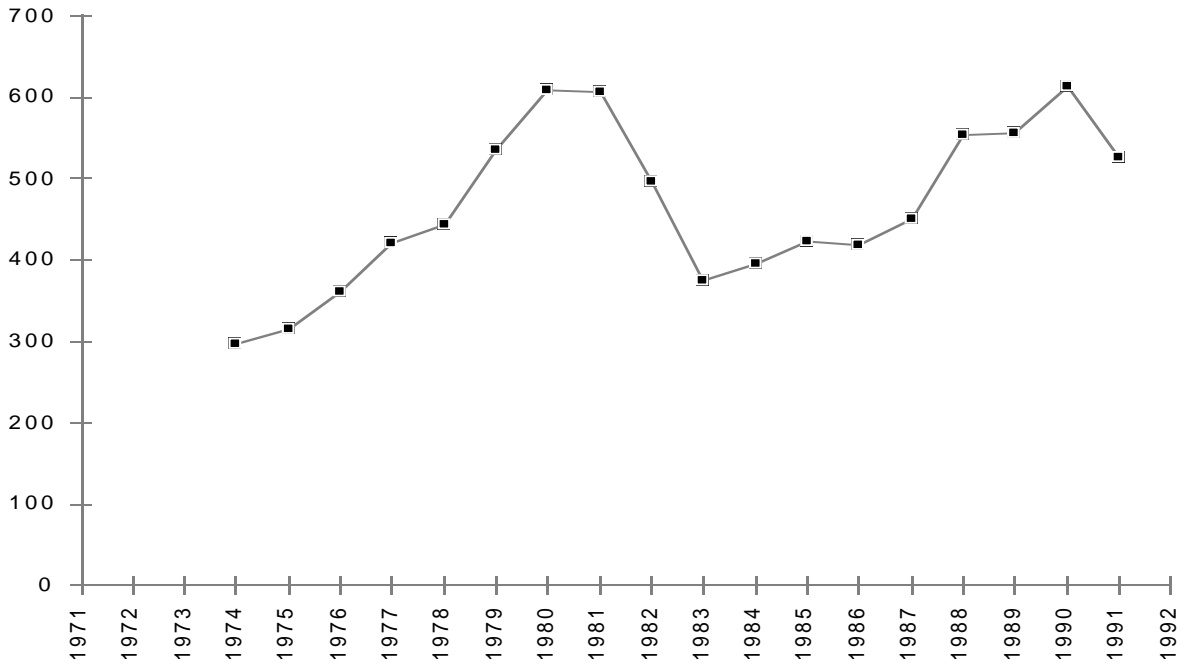
Since its constitution in April, 1992 the Committee met four times; completed the development and adoption of an operating protocol; completed solicitation of initial input in setting priorities; established a list of Interested Parties; established and had members appointed to the Secretariat; set its first priority — repetitive strain injuries — and received written submissions; initially reviewed twenty-one lower experience diseases on Schedule B; received legal confirmation of the procedural requirements to amend Schedule B and the list of diseases designated or recognized by regulation; began a preliminary review of occupational disease issues that may warrant recommending legislative amendment; and consulted on a draft protocol for assessing medical/scientific information.

Our work in progress includes the comprehensive review of Schedule B and diseases designated and recognized by general regulation that must be completed by April 6, 1994; the protocol for assessing medical/scientific information; and the finalizing of plans to address repetitive strain injuries. Other issues will be staged for review later in 1993.

Total in Table E — Analysis of Wage-loss Industrial Disease Claims First Paid

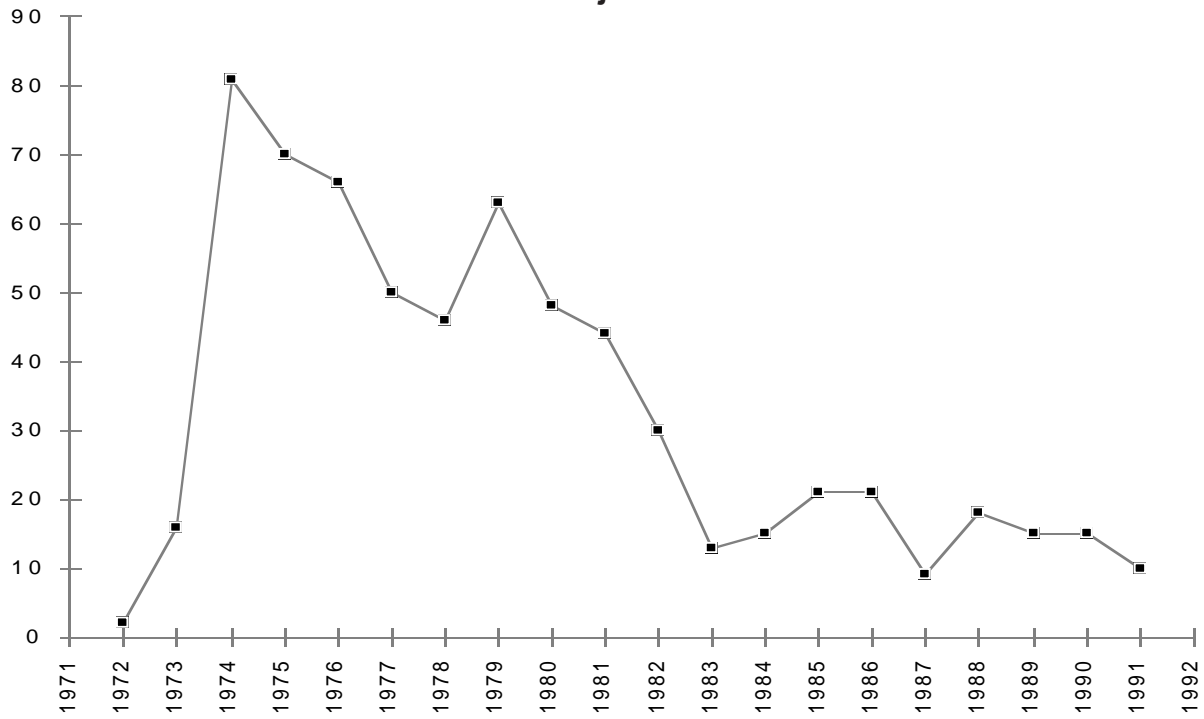


Chemical Burns

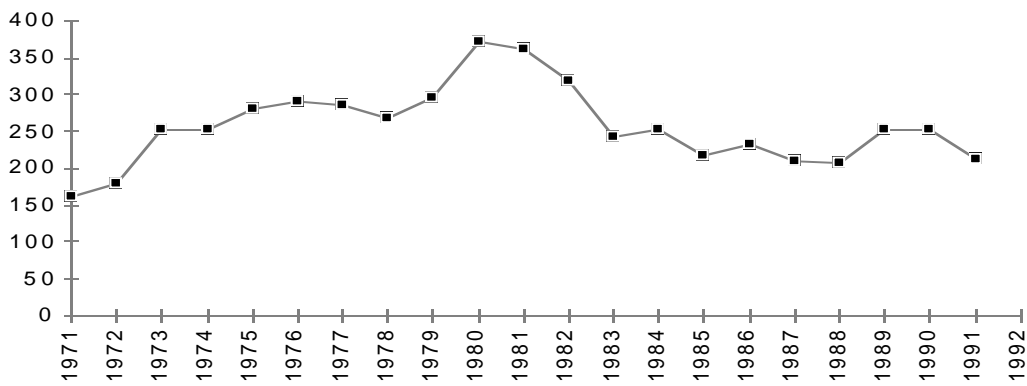




Conjunctivitis

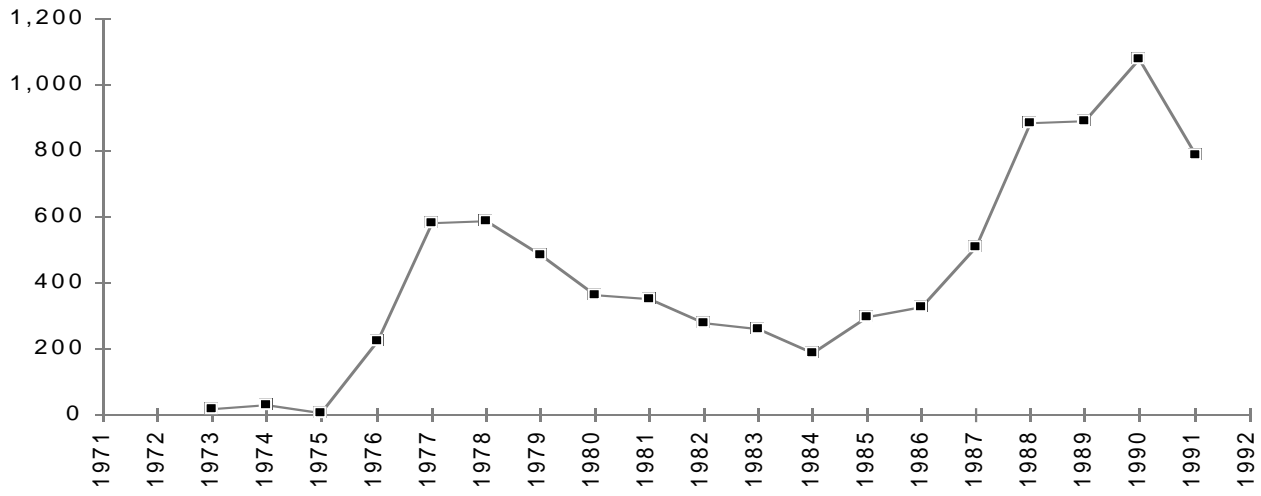


Dermatitis

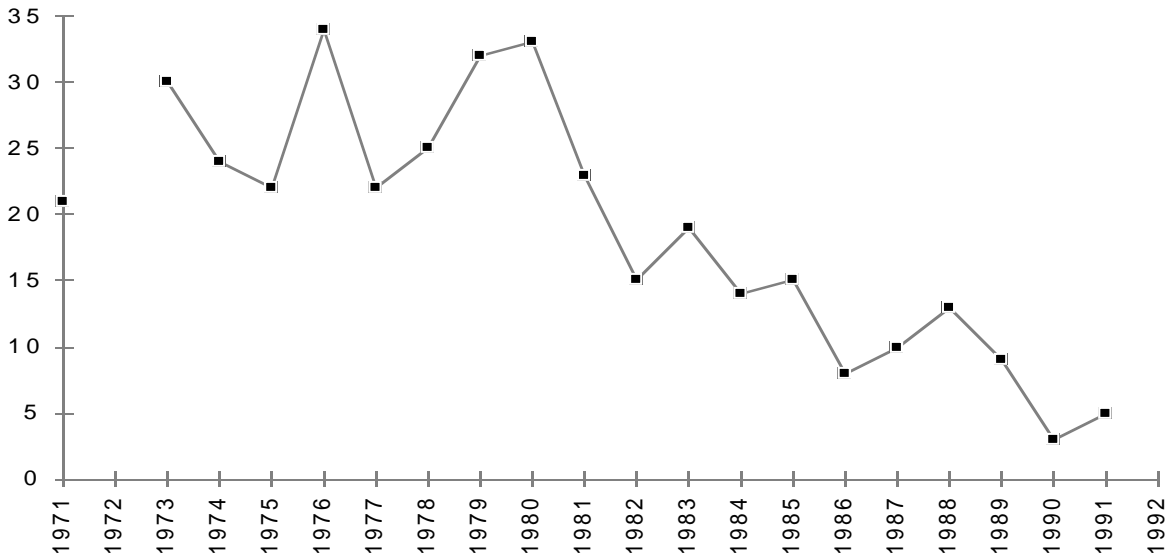




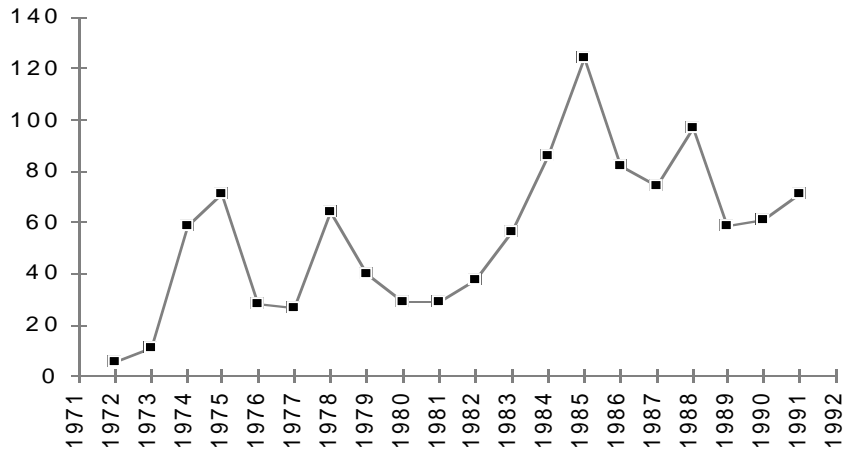
Hearing Loss



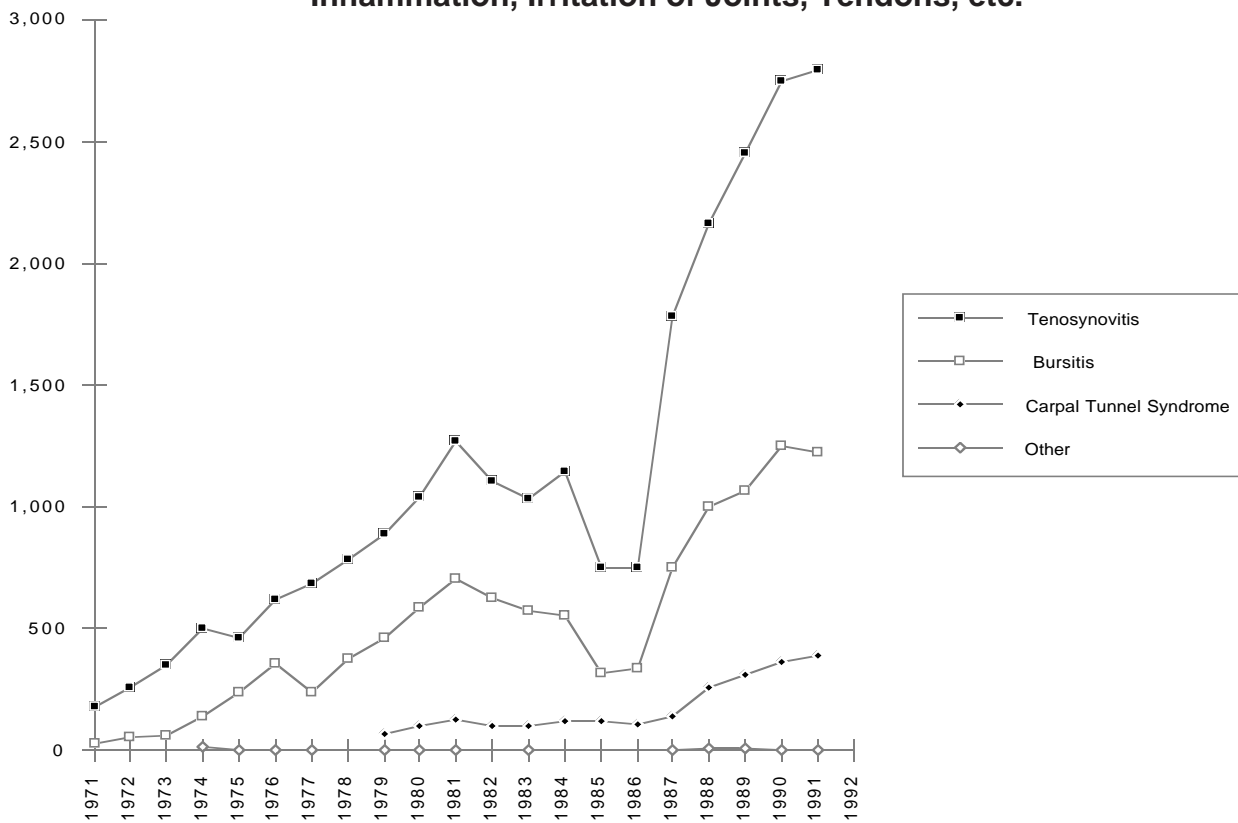
Infected Blisters



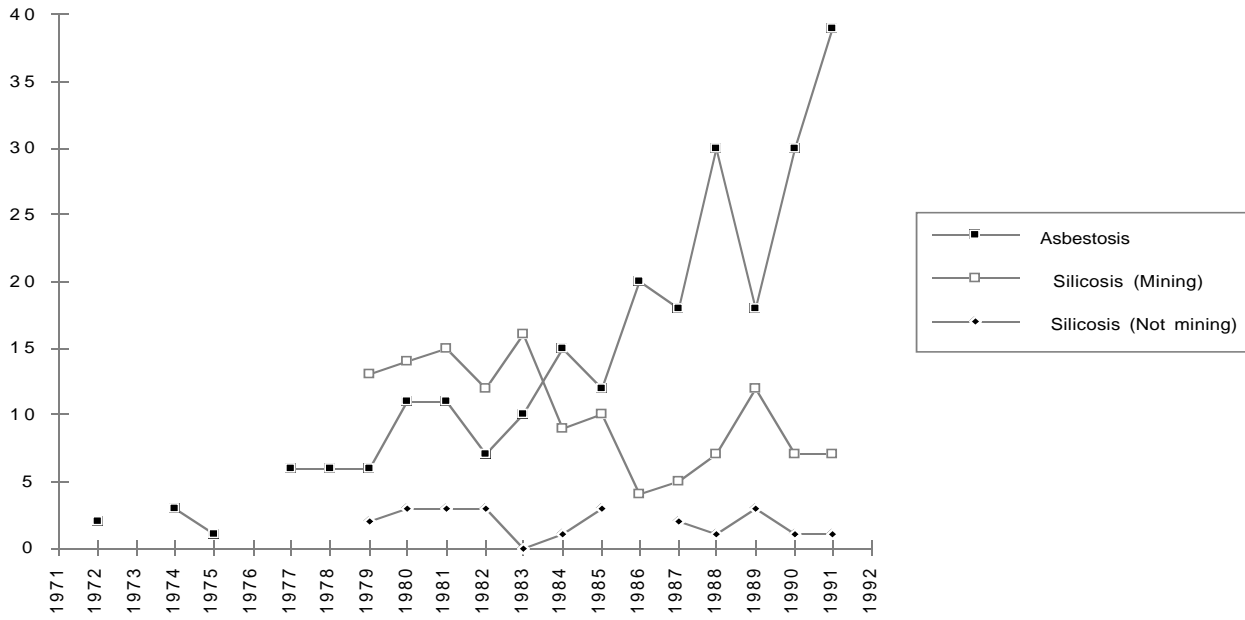
Infectious Diseases



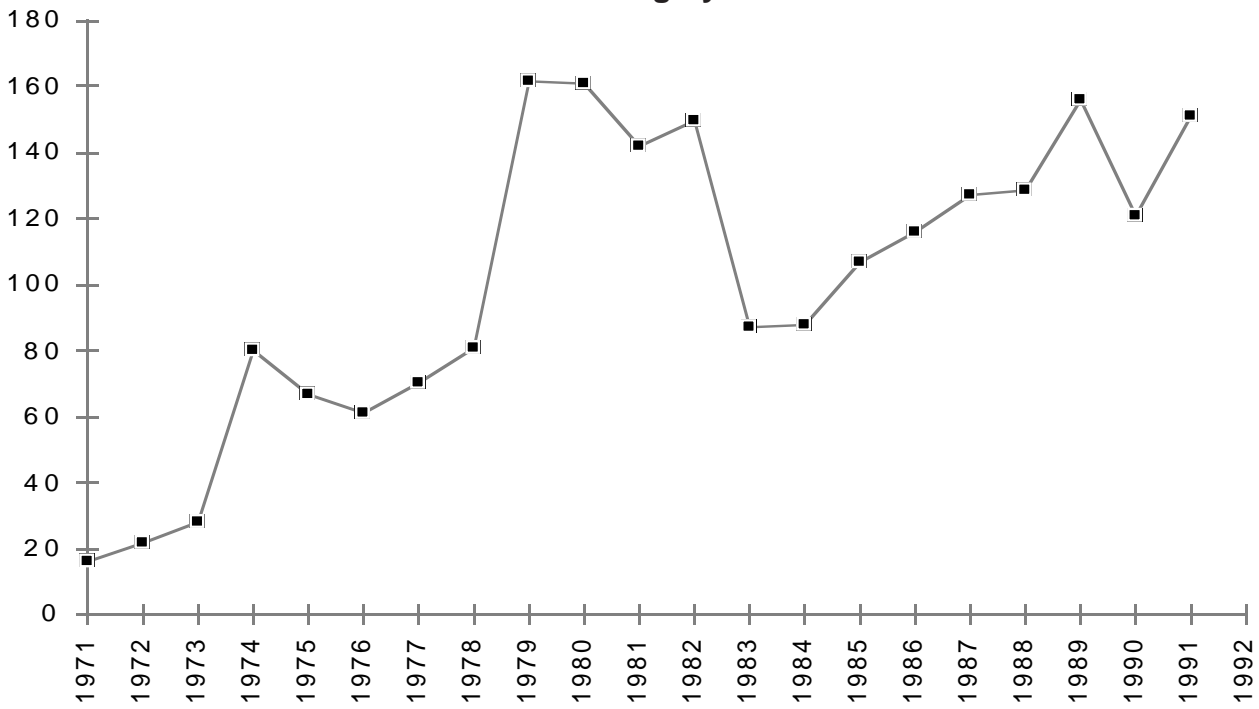
Inflammation, Irritation of Joints, Tendons, etc.



Asbestosis and Silicosis

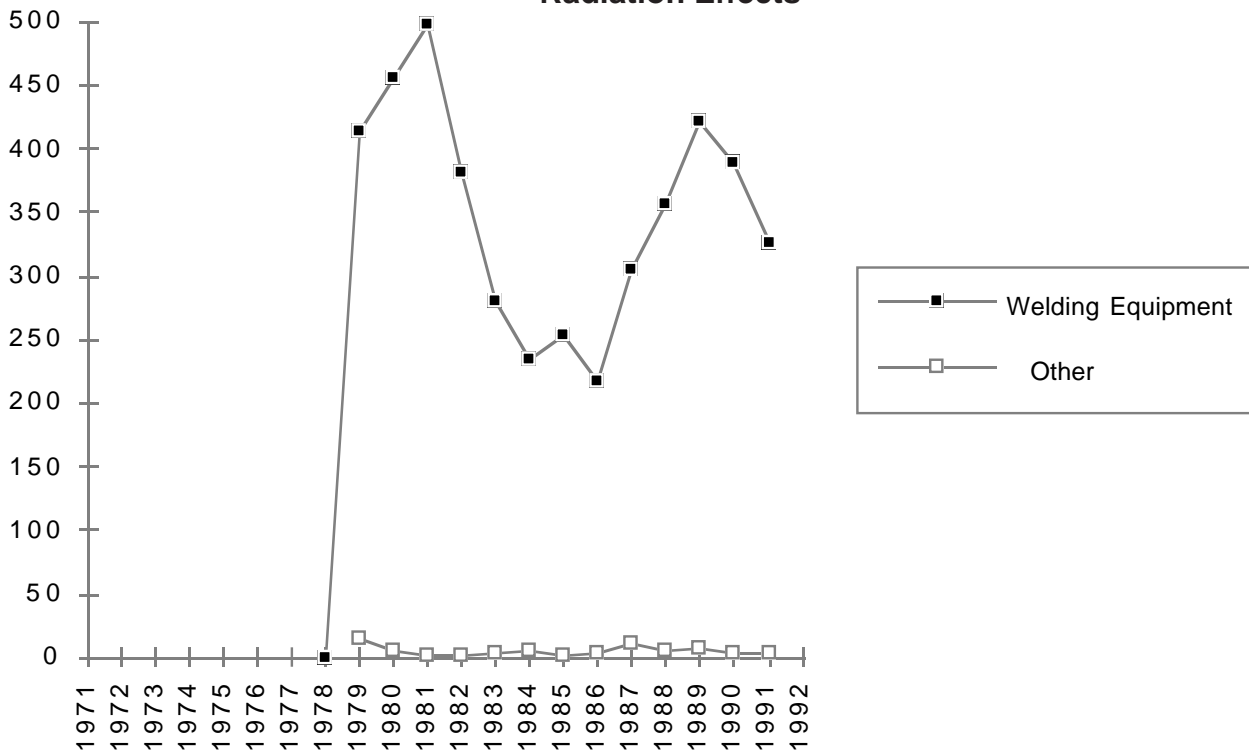


Poisoning Systemic

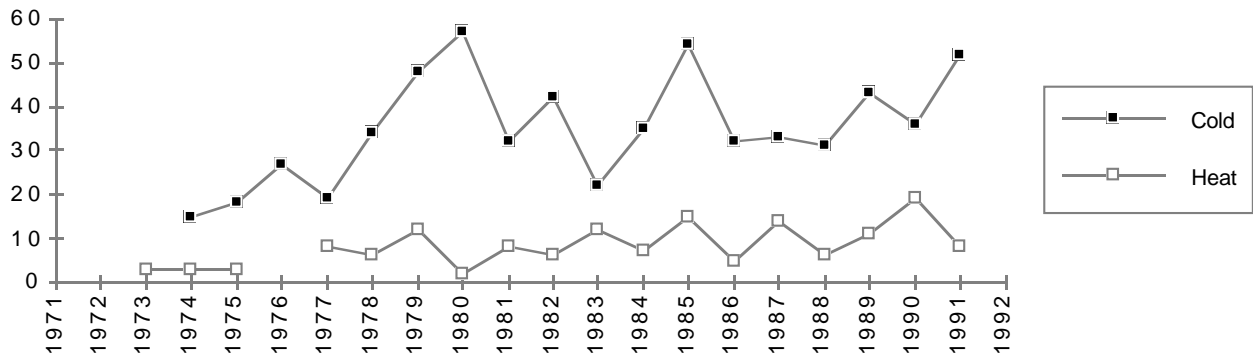




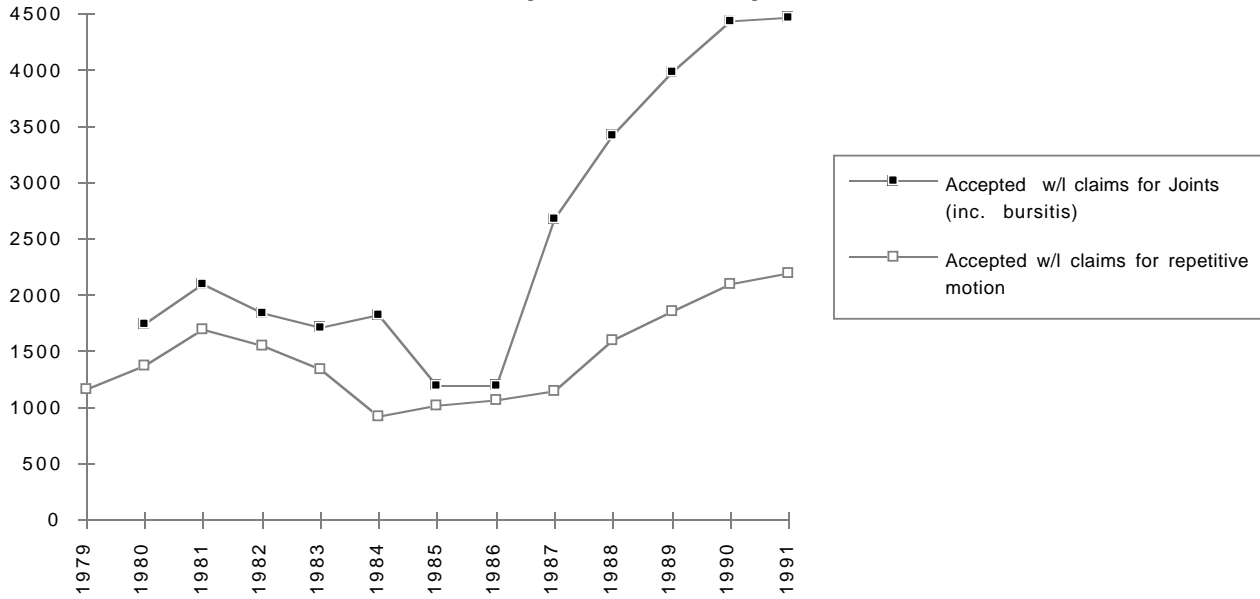
Radiation Effects



Temperature Extremes



Joint Claims Analysis Accepted Wage Loss Claims Repetitive Non-repetitive



Coding procedures changed in 1987 so that some injuries previously reported as contusions or strains are now classified as tenosynovitis. Traumatic Tenosynovitis cases are excluded for 1978-83 and 1985/86.



REPORTER

Consumer Price Index Adjustments

Date: June 14, 1993

WHEREAS section 25 of the *Workers Compensation Act* requires the Board to determine as of July 1, 1993, a ratio by comparing the Consumer Price Index for April 1993 with the Consumer Price Index for October 1992, and by applying that ratio to adjust those periodical payments of compensation referred to in subsection (2), and to adjust each dollar amount mentioned in the *Act*, except those referred to in subsection (5);

AND WHEREAS the Board is advised that the Consumer Price Index for April 1993 was 129.9 and for October 1992 was 128.5, giving a ratio of 1.01089494;

THE BOARD HEREBY DETERMINES that the ratio applicable under Section 25(1) is 1.01089494;

AND THAT all periodical payments of compensation described in Section 25(2) shall be adjusted by applying that ratio as of the 1st day of July, 1993;

AND THAT the British Columbia Regulation numbered 468/92 be repealed as of the 1st day of July, 1993;

AND THAT all dollar amounts referred to in all sections of the *Act* described in Section 25(4) shall be adjusted as follows:

Section No.	January 1, 1993 Dollar Amount	Change to	July 1, 1993 New Dollar Amount
3(5)(c)	87.14		88.09
13(2)	17,429.80		17,619.70
	3,486.00		3,523.98
17(2)	2,091.51		2,114.30
	697.18		704.78
	697.18		704.78
17(3)(a)(ii)	226.51		228.98
17(3)(c)	731.93		739.90
17(3)(d)	34,859.43		35,239.22
	3,486.00		3,523.98
	31,373.43		31,715.24

Section No.	January 1, 1993 Dollar Amount	Change to	July 1, 1993 New Dollar Amount
17(3)(e)	731.93		739.90
17(3)(f)(iii)(B)	226.51		228.98
17(3)(g)	24,401.65		24,667.50
17(3)(h)(i)	400.86		405.23
17(3)(h)(ii)	400.86		405.23
17(3)(i)(ii)	400.86		405.23
17(13)	1,743.05		1,762.04
18(1)	303.31		306.61
	94.13		95.16
22(2)	1,133.00		1,145.34
29(2)	261.44		264.29
33(5)	1,133.00		1,145.34
35(5)	156.22		157.92
71(8)	17,429.80		17,619.70
73(2)	34,859.43		35,239.22
74(3)	174,297.29		176,196.25
75(2)	34,859.43		35,239.22
75(3)	3,486.00		3,523.98
77(2)	3,486.00		3,523.98
Schedule C	731.93		739.90

AND pursuant to Section 25(4), all sections containing such dollar amounts are deemed to be amended accordingly.

REPORTER

Maximum Wage Rate Adjustments

Date: May 25, 1993

WHEREAS Section 33 of the *Workers Compensation Act* requires the Board to determine the maximum wage rate to be applicable for the following calendar year in the manner therein prescribed;

AND WHEREAS the Board is of the opinion that the sum of fifty-one thousand two hundred fifty-four dollars and ninety-three cents (\$51,254.93) represents the same relationship to the sum of forty thousand dollars (\$40,000.00) as the annual average of wages and salaries in the province of British Columbia for the year 1992 bears to the annual average of wages and salaries in the said province for the year 1984;

AND WHEREAS the said *Act* provides that the resulting figure may be rounded to the nearest one hundred dollars (\$100.00);

THE BOARD HEREBY DETERMINES that the maximum wage rate to be applicable for the year 1994 under Section 33 of the *Workers Compensation Act* is fifty-one thousand three hundred dollars (\$51,300.00);

AND THAT in subsection (6) of the said section, the sum of fifty thousand six hundred dollars (\$50,600.00) appearing therein will be changed as at the first day of January, 1994, to read fifty-one thousand three hundred dollars (\$51,300.00).



1992 Annual Report — Medical Review Panel Department

Date: March 1993

Formation of the Medical Review Panel (M.R.P.) Department

The Medical Review Panel process evolved out of concern for achieving fair, cost effective and final resolution of difficult medical issues involved in occupational injury/disease claims.

Occupational injury and disease claims can be difficult and expensive for workers' compensation systems to resolve. They can raise complex medical issues — diagnosis, causation, the extent of current and future disability, and apportionment between work-related and non-work-related causes. The resolution of these cases in a fair manner requires the evaluation of specialized technical evidence by the parties and the adjudicators. Many question the ability of lay decision-makers to accurately evaluate conflicting medical opinions brought before them by parties having differing interests in order to produce fair decisions.

The *Workers Compensation Act* recognizes the significance of medical issues in the adjudication process by providing for a right of appeal to a panel of three physicians independent of the Workers' Compensation Board.

Decision making by Medical Review Panels is a unique and significant process in the dispute resolution systems in the British Columbia Workers' Compensation system. The Medical Review Panel is the final decision maker on matters pertaining to the medical questions on the appeal. The decision of the M.R.P. is binding on the Board.

There is an exquisite balance in the relationship of the M.R.P. process to the Workers' Compensation Board. On the one hand, there is a need for independence from the Board; on the other hand, the compilation of data upon which an M.R.P. can make a judgmental decision is dependent upon the Board's resources and personnel. This sensitive balance is important to preserve and maintain.

To further the independence of the M.R.P. process and to eliminate any arguments regarding conflicts of interest involving the Appeal Division or the Board's administration, the Board of Governors made a decision in 1991 to remove the M.R.P. administration from the Appeal Division and make it a separate entity as a department with its own geographically separate unit. The position of registrar, M.R.P., was created as well as the managerial position within the department. The M.R.P. Department reports to and is responsible to the chairman of the Board of Governors and administers the M.R.P. process.

New and Expanded Facility and Staff Additions

In May 1992, the department moved to new facilities on the 5th floor of the Richmond Administration Building. New staff additions were made, including a secretary, a clerk steno, and a medical appeals officer.

In December 1992, the facility was expanded to include two medical appeals officer offices and a conference room.

Activities of the Department

1. The Medical Review Panel Report

In September 1991, the governors of the Workers' Compensation Board commenced an examination of the M.R.P. process. Dr. Leonard C. Jenkins, an independent physician, was retained to conduct an independent study. The results of this study, *A Review of the Administrative, Policy, and Procedural Functions of the M.R.P. Process, with identification of Issues and Recommendations*, were presented to the governors at their August 17, 1992, meeting. Public distribution of the report commenced in late October 1992.

The report was intended to serve as:

- a public document for information and education on the current administrative, policy and procedural function of the M.R.P. process;
- an identifier of issues within the process
- a list of recommendations aimed at facilitating and improving the process.

The implementation process of the recommendations is currently evolving.

Copies of the M.R.P. Report may be obtained from Films & Posters, W.C.B., Box 5350, Vancouver, B.C. V6B 5L5.

2. **Medical Review Panel Education Days**

The *Act* intends that the panel members receive the support, education, and training necessary to be competent in their roles.

The First M.R.P. Education Day for M.R.P. Chairmen was held on May 29, 1992, at the Workers' Compensation Board. The M.R.P. chairmen had not met as a group since May 1990 and very infrequently prior to that date. There was a recognized need to have an update on the significant changes and future directions of the Board, having a direct bearing on M.R.P. processes and chairmen's activities. Other subjects and processes that were discussed were principles of natural justice, medical/legal terminology usage and impact on M.R.P. certificates, the claims adjudication process and the M.R.P. statistics. An open forum of discussion of issues identified in the M.R.P. process (and previously circulated to the chairmen) occupied the afternoon of the Education Day.

The Second M.R.P. Education Day for M.R.P. Chairmen was held on November 19, 1992 at the Workers' Compensation Board. The full M.R.P. Department staff also attended this meeting. Subjects discussed were: M.R.P. chairmanship; leadership and independent public stewardship; the changing W.C.B.; M.R.P. Department update and 1992 statistics; chronic back pain; and chronic pain syndrome. The afternoon was spent reviewing Dr. Jenkins' report with special focus on an Advisory Committee of elected chairmen.

3. **Performance/Outcomes of the M.R.P.**

(a) **Frequency of Use**

In 1992 a total of 574 new M.R.P. applications were received. The majority resulted from appeals of the Appeal Division decisions and referrals (61.3%). Other sources were appeals from decisions by Board officers (19.9%), findings by Review Board (18.3%) and by the former commissioners (0.5%). (See Table 1.)

Applications thus continued to increase in 1992, as did the numbers awaiting consideration. During 1992, 574 applications were received. This represents a 14.8% increase over 1991. As of December 31, 1992, 649 applications are active.

The specialties that were used in M.R.P. in 1992 are consistent with previous years. For instance, in both 1991 and 1992, 13 different specialties were used. Orthopaedic surgery is by far the most commonly used specialty (72.5% of panels). Other specialties utilized in 1992 included:

Neurology	10.0%
Respiratology	3.3%
Rheumatology	2.7%
Otolaryngology	1.8%
Internal Medicine	1.3%
Cardiology	1.3%
Plastic Surgery	1.3%
Psychiatry	1.3%
Dermatology	0.4%
Ophthalmology	0.4%
Urology	0.4%

The most common medical issue that goes to an M.R.P. is the question of causality or work relatedness of the condition. Though many types of conditions are assessed by the Medical Review Panels, not surprisingly, back conditions and those associated with chronic back pain are the ones most commonly involved.

During 1992, 222 panels were held. This compares to 203 held during 1991. (See Table 2.)

The average number of days for the completion of M.R.P. has generally decreased, although not consistently over the past eight years. During 1992 it was 400 days (13 months) for completion of M.R.P. appeals, i.e. the time from the date of application to the implementation of the M.R.P. certificate.

The issues identified in the report (158) indicate that further improvements in efficiency of the process are possible. Twenty seven of the 158 recommendations in the report deal with the question of reducing delays. The additional staff acquired in 1992 are essential in maintaining a thrust to reduce the backlog.

(b) **Decision Outcomes of Panels**

Medical Review Panel certificates were consistent on decisions and outcomes of appeals between 1987 and 1992 with 41% of certificates upholding (confirming) the Board's decision; 49% disagreeing and 10% partially disagreeing (upholding). (See Table 2.)

(c) **Costs**

The 1992 costs per M.R.P. panel are summarized in Table 3. The total annual operational budget for the M.R.P. Department was \$617,634. The health care component (chairmen and specialists members M.R.P.) was \$526,437, giving a total annual expenditure of \$1,144,071.

The M.R.P. process is considered a success in B.C., as evidenced by some 52 parties interviewed during the development of the report. There was not one person interviewed who suggested that the Medical Review Panel process should be discontinued. The fact that it is not immune to criticisms is apparent from the number of issues that we have been able to identify (158). However, even when issues were raised there was a high degree of satisfaction with the process and strong support for the fact that a final binding decision was being made on a medical dispute by a group of community physicians.

Table 1

**Source Patterns for New Medical Review Panels Applications
(For Period January 1, 1992 — December 31, 1992)**

Decision Maker	Numbers	Percent (%)
Appeal Division — Decision	337	58.7
Referral	15	2.6
	} 352	} 61.3
Board Officer	114	19.9
Review Board	105	18.3
Bill 15 (Decision 3)	0	0
Former Commissioners	3	0.5
TOTALS	574	100

Table 2

M.R.P.: Six-Year Trends in Panel Certificates

Year	Panel Exam	Certificates Received	Certificates Implemented	Decisions		
				Confirm	Disagree	Partial Disagree
1987	254	211	148	58	73	17
1988	299	314	358	131	182	45
1989	297	290	291	114	143	34
1990	222	231	250	110	117	23
1991	203	203	165	66 (41%)	87 (52%)*	12 (7%)*
1992	222	212	173	77 (44%)	83 (48%)*	13 (8%)*
TOTALS	1,497	1,461	1,385	556 (41%)	684 (49%)	144 (10%)*

* Percent (%) on basis of Certificate Implemented.

Table 3
1992 Costs Per M.R.P. Panel

Operational Budget	Totals	Cost Per Panel Held
M.R.P. Department*	\$617,634	\$2,782
Operating		
Salaries Payroll	\$513,296	
Supplies & Stationery	4,528	
Communications	3,274	
Equipment	61,621	
Publications & Advertising	14,494	
Other	20,299	
Travel Expenses	122	
	(Capital \$74,708)	
Health Care*	\$526,437	\$2,371
TOTAL	\$1,144,071	
M.R.P. HELD	222	\$5,153

* 1992 — Health Care = Costs of chairmen and specialist members M.R.P. fees.



Protocol for the Assessment of Medical/Scientific Information — Industrial Diseases Standing Committee Workers' Compensation Board of British Columbia

Date: March 2, 1993

This PROTOCOL FOR THE ASSESSMENT OF MEDICAL/SCIENTIFIC INFORMATION has been adopted by the Industrial Diseases Standing Committee of the Governors of the Workers' Compensation Board of British Columbia on March 2, 1993.

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Executive Summary

This protocol attempts to describe in a reasonably concise manner the sort of medical/scientific information that is useful in deciding questions about occupational causation of disease.

The underlying simplicity of the scientific method is stressed, and the application of this method to experimental and non-experimental situations is explored.

In view of the particular importance of epidemiological methods in the modern assessment of occupational hazards, the protocol examines some of the techniques used in modern epidemiology, and the criteria by which published studies may be judged.

Every attempt has been made to keep the concepts simple. It must be recognized, however, that some questions can be quite complex, especially where the data from some studies seem to contradict other evidence.

A Glossary gives brief explanations of some of the technical terms that may be encountered in the medical/scientific literature.

A number of examples are used to illustrate the concepts being discussed. In order to keep the main text as concise as possible, most of these examples are placed in an Appendix.

1. Introduction

With increasing specialization in the sciences, the development of jargon peculiar to each science, and the rapid development of technical methods, many people have come to feel that they cannot hope to understand why and how a certain conclusion has been reached. They are forced to rely on the advice of experts, but the experts often seem to disagree.

Also — too often, it seems — some experts are revealed to have been incompetent or to have had a vested interest in one side of a dispute. The general credibility of experts therefore declines. The unfortunate non-expert is left confused and frustrated.

Fortunately, the general principles of most scientific disciplines are almost “common-sense” in their simplicity. An understanding of these principles can provide the non-expert with the ability to at least separate the very strong evidence from the very weak.

Such an understanding can also help in the gray area between fairly strong and fairly weak. Although the non-expert may have to refer an issue to the experts, he or she should at least be able to discern the broad issues that are causing any remaining controversy.

For these reasons, the Industrial Diseases Standing Committee (I.D.S.C.) has attempted to describe the issues in simple terms, and to show how apparently complex questions of causation are usually confounded more by missing or conflicting information than by matters of basic principle.

2. The Scientific Method

In the context of occupational disease, the scientific method can most easily be described as “seeing what happens when one thing is changed while everything else is kept the same.”

In practice, it is often very difficult to be sure that everything else has indeed been kept the same, especially if there is a long interval between the change (usually exposure to a toxic agent) and the effect, or if free-living human beings are studied, rather than mice in a laboratory.

If the interval between exposure and illness is very brief, the causal relationship between the two can be very obvious. For example, a worker may be overcome rapidly by a toxic gas, and the process may be so obvious that there is no question about cause and effect.

Similarly, symptoms may improve over the weekend or during a vacation, only to return after a few hours back at work. This would strongly suggest that there is a causal link between the symptoms and something in the workplace.

These common-sense cause-and-effect relationships are not really different from the epidemiological techniques to be examined later. In the common-sense examples, the standard epidemiological approach of comparing “observed” to “expected” frequencies is made easier by the fact that the *expected*, or normal, pattern of health is readily recognized, and the *observed* change is immediate and unambiguous.

3. Laboratory Tests

There are obvious ethical limitations on the use of humans as experimental subjects in the study of harmful substances. In the laboratory, however, it is relatively easy to set up an experiment in which a standard biological “preparation” is kept stable except for a change in one item. (The word *preparation* is used here to include a range of techniques, from the use of experimental animals to the study of bacteria or cell cultures. A preparation subjected to a change is called an *exposed* or *experimental* group. A preparation that is kept stable is called an *unexposed* or *control* group.)

Laboratory testing of potentially toxic agents has the great advantage of speed and well-controlled experimental design. It is, therefore, of most value in the regulatory process, to help decide whether a substance should be allowed on the market or whether it is likely to be too hazardous.

The main problem with laboratory evidence is the extent to which we can apply it to human experience. In the occupational compensation context, non-human laboratory evidence is helpful in strengthening the findings of epidemiological studies that are borderline significant in terms of certain “criteria of causality” (to be discussed later). In any case, epidemiological studies may show a substance or work process to be toxic even though laboratory studies are negative, and vice versa.

Section 5 of this protocol examines the criteria of causality in detail. These were originally proposed as a way of assessing whether there was a true cause-and-effect relationship in observational, or *non*-experimental studies in human beings. They are not a set of rigid rules, but simply guidelines. The relative importance of each criterion may vary according to the circumstances.

The criteria are also useful for other types of data, and are therefore summarized here. The more of the following that one sees, the more confident one can be that a cause-and-effect relationship exists:

- **Strength of association.** Dividing the frequency of an effect in the exposed group by that in the control group gives a ratio that is the same as the “relative risk” calculated in human observational studies. The larger the ratio, the greater the likelihood that there is a true causal relationship rather than an accidental result due to “confounding variables.”
- **Consistency.** Has the same apparent cause-and-effect relationship been seen in more than one experiment?
- **Dose-response.** Typically, the bigger the dose, the bigger the effect should be. If this dose-response relationship is not seen, one may question whether the effect is truly related to the suspected cause. Sometimes, however, a limiting factor may cause the dose-response curve to flatten out at higher levels. At the other extreme, there may be a threshold dose, below which there is no ill effect.
- **Coherence.** In both laboratory and real-world studies, a result is more convincing if it fits in with previous knowledge of similar chemicals or similar biochemical mechanisms. There is a danger that a truly new discovery may be overlooked because it does not conform to existing knowledge, so this criterion must be used with caution.

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- **Temporal relationship.** Simply put, this means that a cause must precede an effect. This is more likely to be ambiguous in human studies than in laboratory experiments.

The term *temporal relationship* also includes the idea of a latent interval in the development of a disease such as cancer. This applies to both laboratory studies and human epidemiological studies. For example, small animals usually have to be fed carcinogenic substances for weeks or months before excess cancers appear. If an excess cancer appeared within one week, the investigator would suspect that some other factor was at work, and would tend to discount the reliability of the result.

- **Specificity.** This criterion is most useful in human studies, where a specific exposure is typically associated with a specific result. The location or other characteristics of a cancer induced in animals may differ from that in humans. For any given animal and given exposure, however, there tends to be one or possibly two organs that are particularly affected by a specific carcinogen.
- **Statistical significance.** The phrase *statistically significant* is impressive, but all it means is that the observed difference in disease frequency between experimental and control groups is greater than one would expect if it were due to chance alone.

If each group has a very small number of animals, a very large difference in disease frequencies would be needed for the result to be significant. On the other hand, if each group has a very large number of animals, a very small difference in frequencies may make the result statistically significant, even though there is really no *practical* difference between the groups. Because of this, statistical significance is closely tied to, and should be considered with, strength of association, which is measured by the *ratio* of the frequencies, rather than the frequencies themselves.

4. Types of Epidemiological Study

The discipline of epidemiology began over a hundred years ago as a way of learning more about the nature of epidemics of infectious disease — hence the name. About 1950, there began a rapid expansion of this approach into areas of *non-infectious* disease. As a result, modern epidemiology is largely concerned with the study of such things as cancer, coronary heart disease, and other “degenerative” diseases.

The basic types of study are described below. Some recent innovative occupational techniques are outlined at the end of this section.

Experimental Cohort Studies

Although the experimental study is rarely suitable for occupational situations, it is very useful as a “gold standard” from which to begin discussing the various types of study that are available. The word *cohort* is commonly encountered in epidemiological studies. It implies that we have been able to identify two or more groups of individuals who appear to be similar in all respects except in their level of exposure to the hazard being studied. (See Glossary for further explanation.)

The great benefit of the experimental cohort study is that although it is the simplest type of study, it can be the most convincing if properly carried out. Its main disadvantage is that if potentially dangerous substances are being studied, administering them to humans poses serious ethical problems. The exceptions to this would be in cases where the toxic effect is quickly reversible, leaving no permanent ill effect, and where the volunteers are clearly informed of the risks before being invited to take part in the experiment. In practice, experimental studies are therefore used mainly to test potentially beneficial substances, such as new drugs.

Example:

To examine the effect of a slightly harmful substance, a large group of reasonably similar volunteers is assembled. Half are randomly allocated to one of two groups, and the other half are assigned to the second group. The first group (the experimental or exposed group) receives an injection or other type of exposure to the substance being studied. The other group (the control) also receives the same type of “treatment,” but it consists of a *placebo*, a substance that is indistinguishable from the experimental substance but without any ill effects. The reason for this is that if people taking a drug know that it may produce certain effects, they tend to notice and record these effects more often than otherwise. A placebo is used so that both exposed and control groups have the same risk of recording symptoms based on a subconscious expectation of illness.

After an appropriate length of time, the proportion of each group that has developed symptoms is determined. The proportion in the experimental group is compared to that in the placebo or control group. The ratio of these two proportions is called the *relative risk*.

For example, if 20% of the experimental group have become ill, compared to only 10% of the placebo group, the relative risk is exactly 2.0. Similarly, if 50% of the experimental group have suffered ill effects, compared to only 10% of the placebo group, the relative risk is 5.0.

The great strength of the experimental cohort design is that because of the initial random allocation, any differences in susceptibility among the individuals making up the groups should be averaged out by the laws of chance. Provided that the numbers are large enough, the proportion of susceptible individuals should be the same in each group, and the relative risk should not be distorted upward or downward.

As noted earlier, the use of a control group is common practice even in animal research. This is because unrecognized factors in the environment, such as temperature or feeding routines, may lead to changes in the “normal” development of the disease in question, even in the absence of the substance being tested.

Non-Experimental Studies

This type of study is by far the most common source of epidemiological information on possible links between exposures in the workplace and subsequent disease. There are various subdivisions within this category, but all the studies follow essentially the same guidelines.

Since it is not possible to fully examine all the problems and the potential advantages and disadvantages of each type of study without writing a textbook, the following descriptions are deliberately brief and simplified.

The main point to remember about all these studies is that they are *not* experimental. They are characterized by passive “observation,” as compared to the active intervention of an experiment. This means that the process by which individuals enter either the exposed group or the control group is not controlled by the investigator, who would use random allocation. Rather, the process is based on “self-selection” by the individuals who end up in the two groups. Even without any occupational exposure, the groups may therefore not be equally likely to develop certain diseases or to die from certain causes.

At the same time, there are sometimes situations where the process of self-selection appears to have been almost entirely based on chance, rather than conscious choice. These situations are often called “pseudo-random,” or “experiments of nature.”

Observational Cohort (Including S.M.R.) Studies

In theory, a study of cancer in a particular occupational group could be designed today in which a group, or cohort, of individuals would be followed over the next 20 or 30 years. Their cancer frequency would be compared with that of a control group of similar but unexposed individuals in the same industry, or that of the general population. This would be called a *longitudinal* or *follow-up cohort study*.

In practice, an answer is usually needed more quickly than this. It is therefore common practice to go back in time and identify a starting point at which to collect information. *Cohorts* of exposed and unexposed workers are then developed on the basis of personnel records, and the levels of exposure in previous years are estimated.

Part of the work in such a study involves tracing these individuals to see whether they are still alive or have died; and if they have died, what the cause of death was. This type of study is often called a *historical cohort study*, to emphasize the fact that we are not beginning with fresh cohorts *today*.

Composition of the Control Group

An appropriate control group would consist of individuals of the same age and sex who are either working in the same industry in an unexposed occupation, or in a different industry that does not have any known toxic substances. Alternatively, one may use the general population of the country or of the province or state where the study is being carried out. In this case, the study is commonly referred to as an *S.M.R. (Standardized Mortality Ratio)* study, rather than a cohort study.

The comparison between observed and expected is sometimes based on simple numbers (for example, 22 cases versus 11 expected, for a relative risk of 2) or on *rates* (for example, 66 per 1,000 versus 33 per 1,000, for the same relative risk of 2). Typically, cohort studies compare rates while S.M.R. studies compare numbers.

Usually the control group will be of the same sex as the exposed group. If the exposed group has both males and females, the normal practice is to examine each sex separately, using persons of the same sex from the control group as the comparison. Alternatively, the figures can be standardized for the proportion of males and females in the same way that they are standardized for age (see below).

Standardizing for Age and Time Period

Whatever type of control group is used, in studies of chronic diseases such as cancer it is very important to ensure that the exposed and control groups are balanced in terms of age. This is because the natural frequency of cancer, heart disease, stroke, etc., changes very rapidly with advancing age. Unless the two groups are balanced for age, a severely distorted relative risk might result.

The normal procedure for this balancing of age is called *standardizing*. The number of expected deaths is adjusted to reflect the age composition of the exposed population. For example, if the control group has twice as many persons aged 60 to 64 as the exposed group has, the number of expected deaths needs to be divided by 2 to reflect this difference. This procedure is carried out for each five-year age group, and the figures are summed to give an overall total that can then be compared to the total number of observed deaths in the exposed group.

Another precaution that should be taken is to ensure that the observed and expected deaths are sorted by different time periods, such as 1970 to 1974, 1975 to 1979, etc. The reason for this is that death rates from many diseases have changed over the years. It would not be appropriate to estimate today's expected deaths using death rates from 20 or 30 years ago, since some death rates have changed substantially over this period.

Thus, to assess the value of a non-experimental cohort study, the first questions that should be asked are:

- What is the comparison, or control, group? How was it chosen? Were there any rules for inclusion or exclusion?
- Have the figures from the control group been adjusted to reflect the age and sex distribution of the exposed group and the calendar years during which the observed figures were collected?

S.M.R. Study versus Cohort Study

As previously pointed out, a study that uses a specific control group made up of other workers is usually called a *cohort study*, while the same design using the general population as the control group is usually referred to as an *S.M.R. study*. S.M.R. studies have two advantages:

- The mortality rates for the general population are readily available from published volumes of vital statistics each year; and

-
- Since they are based on relatively large numbers of people, the figures are more stable than those in a typically much smaller group of unexposed workers.

The main disadvantage of using the general population as the control group is that the mortality figures from this population include deaths that have occurred in chronically sick individuals. Such persons tend to die earlier than would normally be expected. They may also have never been able to find work because of their disability.

This means that the death rates in the general population are usually higher than those in a group of individuals who are employed in a regular job. This is known as the *healthy worker effect*, and it often creates an approximately 10% to 20% difference in the ratio of observed to expected deaths — that is, an S.M.R. of about 80% to 90% (0.8 to 0.9). For example, it may be found that over a period of several years, there have been 85 deaths in a group of workers, while mortality rates based on the general population would have predicted 100 deaths. The S.M.R. is therefore 0.85 or 85% ($^{85}/_{100}$).

In a cohort study, on the other hand, it must be remembered that a group of unexposed workers chosen to act as the control group may themselves have some unrecognized reason for a mortality rate that is higher or lower than it should be. The relative risk in the exposed group could therefore be reduced or exaggerated, not because of any error in the *observed* number of deaths, but simply because of an error in what ought to be the true *expected* number. Example 9 in the Appendix illustrates this source of error.

One way around this potential danger is to have two or even three control groups, each one obtained in a different way — for example, unexposed workers in the same industry, unexposed workers in a different industry, friends or relatives of the exposed individuals, etc. However, this is often a cumbersome way to deal with the problem. A simple alternative is to use the general population as the second control group, since the figures are easy to obtain.

Note that routine population figures are easy to obtain for death rates, but it is often impossible to get reliable figures for non-fatal illnesses. For the latter, it is therefore usually necessary to use a control cohort.

Because the studies just described are not experimental in nature, it is necessary to examine those aspects of the observed/expected comparison that might have distorted the true relative risk. The most widely used framework for carrying out this comparison is the group of *criteria of causality* that will be discussed in Section 5 of this protocol.

Proportional Mortality Ratio (P.M.R.) Studies

The procedure for these studies is relatively simple. It consists of comparing the proportion of all deaths in the exposed group that are due to the disease of interest with the proportion of such deaths — standardized for age and period — in the control group.

Example:

It is suspected that more cases of leukemia are occurring in a particular plant than in the general population. Through plant and union records, it is possible to identify 250 former employees who have died in the last 20 years; 25 of these deaths were from leukemia. Among the general population, adjusted appropriately for calendar period and individual age groups, 250 individuals of the same age distribution over the same period would have experienced 12.3 deaths from leukemia.

Thus the relative risk for leukemia in these workers is approximately 2 ($25/12.3$). *This assumes that the number of deaths due to causes other than leukemia is the same in the two groups.*

P.M.R. studies are very commonly encountered in occupational health literature, for the simple reason that they can be carried out without knowing the size and age distribution of the group in which the deaths have occurred. This is particularly useful in industries where there is a high turnover of employees. In such cases, all that may be available is a register or listing of deaths held by a union or similar organization; past personnel records needed to establish “population at risk” figures may not exist.

It should be stressed that this type of study is essentially the same as the traditional observational cohort study described earlier, with one difference: the number of all other deaths, or a special group of other deaths, is used as a “proxy” for the underlying population figures of exposed workers. The general population is often used as the unexposed control group, and to emphasize its similarity to the S.M.R., many epidemiologists now prefer to use the abbreviation *S.P.M.R.* rather than *P.M.R.*

One of the advantages of the proportional technique is that where the control group is the general population, the size of the healthy worker effect is usually decreased. This is because the relative risk is calculated from proportions, rather than from absolute rates. Example 4 in the Appendix illustrates this. On the other hand, where an employee group is used as the control, other types of distortion can occur, as shown in Example 9 in the Appendix.

Thus, proportional mortality studies are very similar to regular cohort or S.M.R. studies. If steps are taken to avoid their potential biases, they can provide very useful information about a job/disease relationship.

Objective versus Subjective Evidence

In most of the studies that have just been discussed, the diagnosis of the illness or the cause of death is not in dispute. This usually means that there are *objective* tests — such as a pathology report on a lump suspected of being cancer — to demonstrate the presence or absence of the disease.

In situations where there is no objective test available and no hard, physical evidence to firmly establish the diagnosis, we may be completely dependent upon symptoms such as pain, dizziness, fatigue, etc. The relationship of this type of *subjective* illness to occupational exposure is much more difficult to either establish or refute.

Very often the best that can be done is to draw up a set of criteria for accepting the disease entity as a “real” disorder, and then, using the procedures already described, try to analyze the frequency with which this disorder occurs in a particular occupation. (See Example 10 in the Appendix.)

Case-Control Studies

In the non-experimental cohort studies we have seen so far, the assumption is that we begin with a healthy cohort and measure illness or death as the outcome.

In the *case-control study*, the analytic process goes in the other direction. We begin with a group of individuals with a certain disease, and look back in time for risk factors that may have affected this group. A control or comparison group is then assembled, consisting of individuals who are not suffering from the disease of interest but who are similar in other respects to the cases in the group with the disease. The frequency of various risk factors in the two groups is then used to produce an *estimate* of the usual observed/expected *relative risk*.

Unlike in the other non-experimental studies, the relative risk is not calculated by comparing the frequency of disease in the exposed group with the frequency of the same disease in the unexposed group. Rather, a “backward” type of arithmetic computation is required to extract an estimate of the traditional relative risk, which still remains the ratio of interest in these epidemiological studies. The computation is based on the idea that the group of healthy controls is a random sample of the general population. The actual procedure is illustrated in Examples 6 and 12 in the Appendix.

Difficulties with Case-Control Studies

The case-control study has not been used as much as it could be in the occupational setting. In part, this has been due to a fear of potential errors due to two factors:

- The use of a control group that is inappropriate or too small; and
- The “recall bias” that often differs between cases and controls when they are asked about past risk factors.

As will be described later, however, a new technique known as the “*nested*” *case-control study* is becoming more popular as part of large cohort studies. (See also Example 7 in the Appendix.)

Both P.M.R. studies and case-control studies are sometimes considered inherently less useful than cohort studies. The I.D.S.C. does not believe that this is justified. If these studies are well designed and carefully executed, they can provide useful information concerning relative risk. In practice, however, they are more difficult to do *well* than a regular cohort study, and for this reason have sometimes given misleading results.

The main advantage of the P.M.R. and case-control approach is that such studies are usually less costly and time-consuming than cohort studies. They are also, of course, the only way to analyze historic data if population figures of exposed workers are not available.

Morbidity Studies

The preceding discussion has been concerned with the structure of the typical mortality study. The same framework can be used where the outcome is not death but illness — a *morbidity study*.

The use of age- and period-adjusted rates from the control population is essentially the same as in other non-experimental studies if:

- The disease being considered is one with a long latent period; and
- Once established, it does not go away even if the subject is removed from exposure.

However, there are situations where it may not be necessary to use such an elaborate design. When the disease comes on rapidly and also disappears rapidly, patients can be used as their own control. For example, a worker who develops asthma can be tested before and after returning to work following a vacation. Alternatively, he or she can be exposed to small quantities of the suspected allergen under carefully controlled conditions in an environmental chamber; a change in respiratory function may be demonstrated.

Another important design for non-fatal diseases is the *cross-sectional study*, in which both the exposure and the presence of disease are measured at the same time, for example, the frequency of chronic bronchitis in workers exposed to irritating fumes. Three examples of this type of study appear in the Appendix (Examples 5, 10, and 12).

New Techniques

Many innovative approaches to epidemiological study have been developed in the past few years. Two that show great promise in the field of occupational epidemiology are the “nested” case-control study and the attributable risk technique.

“Nested” Case-Control Study

In this technique, a small case-control approach is used within (hence, “nested”) a large observational cohort or proportional mortality study. The advantage of this approach is that it usually requires only small numbers, and detailed information can be obtained at relatively low cost.

For example, the disease of interest may be subject to several non-occupational biases, such as smoking, family history, etc. The persons who have developed the disease may be interviewed, or sent a questionnaire, to establish which of the other risk factors they possess. Similar information is obtained from a group of controls who are an appropriate sample of the large number of other participants in the study. An “adjusted relative risk” can be calculated, one free of the uncertainty caused by lack of information about confounding variables. Example 7 in the Appendix illustrates this.

Attributable Risk Technique

The key to this method is that the relative risk in exposed workers is subdivided according to severity and duration of the exposure. Each relative risk is then converted to an *attributable risk* to provide a measure of the probability that an individual case is work-related.

This approach was developed in the United States to deal with claims for radiation. It has been adapted by researchers in Quebec and B.C. for use in the handling of claims for bladder cancer in aluminum workers (see Example 8 in the Appendix). The approach can be extended to some other job/disease situations, and offers potential for:

- Fine-tuning the exposure/disease assessment to allow for duration and severity of exposure, rather than using a simple cut-off of exposed/not exposed for a certain minimum number of years.

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- Resolving the dilemma of how to fairly handle claims in situations that are just above or just below the “balance of possibilities” threshold of 50% (equivalent in epidemiological terms to a relative risk of 2.0). If an appropriate formula can be developed that includes more than simply the relative risk shown by the total exposed group, an estimate of work-attributable risk can be made with more precision. The process of compensation should gain in credibility and perception of fairness if we can vary the cut-off point with degree of exposure, and if we can set the cut-off point so that it is most fair to both the individual *and* society (presumably after all-party negotiations).

5. Criteria of Causality

In 1965, an English statistician, Sir Austin Bradford Hill, put forward a set of criteria to be used as a framework for deciding when a causal relationship can reasonably be assumed on the basis of human studies that are observational, not experimental, in nature.

Typically, Hill’s criteria are applied to situations in which the frequency of a disease in an exposed group is compared to the frequency of the same disease in “normal” people. What constitutes an appropriate “normal” group is often a matter for debate: is it the general population, or is it a similar, but unexposed, group of workers? Also, the way in which the comparison has been carried out can vary, depending on the circumstances. These issues were discussed in Section 4, Types of Epidemiological Study.

In this section, the criteria will be examined as they relate to epidemiological studies in humans. They are illustrated by some examples in the Appendix.

It should be stressed once again that these criteria are not rigid rules. Quite often a study does not adequately meet one or more criteria for a good reason. Sometimes, however, it is because the investigators were simply not familiar with proper epidemiological techniques. The main value of the criteria is therefore to remind the reader of the components of an epidemiological study, and thus aid in assessing its reliability and validity.

A. Strength of Association

In simple language, this means that the bigger the relative risk, the greater the likelihood that there is a true cause-and-effect mechanism at work. However, other factors must be considered before assuming that the study with the highest relative risk is necessarily the most valid. One reason for a very high relative risk may be that the study has been based on very small numbers. For example, if the expected number of cases is only 0.01, just one observed death will give a relative risk of 100 ($1/0.01$) — an unusually high figure, but one with a high probability of being due to chance. (See Examples 1 and 2 in the Appendix).

A more common problem is found in human studies at the other extreme, when the relative risk is found to be above 1, but not by very much. For example, a relative risk of 1.4 or 1.5 is by itself not very impressive, because there are so many confounding variables, such as cigarette smoking, nutrition, genetic background, etc. A relative risk below about 2 quite often turns out to result from a different distribution of confounding variables in the exposed group compared to the control group.

The main exception to this rule is tied in with another criterion, dose-response, which will be examined later. If, in a carefully designed study, there is a clear gradient from lower dose to a higher dose rising through figures such as 1.2, 1.4, and 1.6, these otherwise low and unimpressive relative risks become much more convincing.

By chance, a relative risk of 2 also happens to coincide with the shift in probability from “less likely than not” to “more likely than not.” For example, if there are 20 cases instead of 10, the additional 10 cases will presumably be due to the exposure, so on average, for each individual, the best estimate of the probability of work causation is 50%.

Another problem follows from this. It might be argued that if there is a relative risk of just over 2, *all* affected individuals should be compensated, but if it just under 2, *none* should be compensated. This problem was addressed briefly in Section 4, under the heading “Attributable Risk.” See also Example 8 in the Appendix.

B. Consistency (Reproducibility)

This criterion should remind the reader that the result from a single study may be a fluke, and is therefore usually not enough to justify the conclusion that a causal relationship exists. The term *reproducibility* is often used in place of *consistency*.

When several epidemiological studies all involve the same type of work environment, it is helpful to see (a) whether most give a relative risk in the same direction above or below 1, and (b) whether the size of the relative risk is approximately the same. The reader must also keep an eye on the size of the studies. There is likely to be much more variation in the size of the relative risk if the studies are based on small numbers. At the same time, however, a study based on very large numbers may have some inherent bias that makes it *less* accurate than some of the smaller studies. Thus the criterion of consistency has to be used with flexibility and an awareness of the problems and pitfalls that can arise in all scientific studies, whether in humans or not.

Another consideration under this heading is the existence in the published literature of what is known as a “publication bias.” There is stiff competition to get studies published, and they are most likely to be published when the conclusions are new or controversial. Initially it would probably be difficult to get a study published

showing that there was *no* apparent ill effect from a particular exposure. It is only later, when several studies have been published apparently showing that there *is* an effect, that editors may become more interested in publishing a negative result, since this now gives a conflicting view.

C. Dose-Response

As noted earlier, a dose-response relationship can add strength to an otherwise unimpressive result. Needless to say, if the relative risk is already large, the addition of a dose-response relationship makes the conclusion even stronger.

A good example of this appeared in one of the original studies on cigarette smoking and lung cancer conducted by Doll and Hill (the same Hill responsible for the criteria that we are now discussing).

Non-smokers formed the basis for the expected figures, since they had not been exposed to the suspected agent. Overall, regular smokers had a lung cancer rate of 104 per 100,000, compared to 10 per 100,000 in the non-smokers, for a relative risk of 10.4. Within these figures, there was also a very clear gradient according to the number of cigarettes currently smoked. The figures for relative risk form an almost perfectly straight line, rising steeply from the non-smoker baseline of 1 to approximately 20 for a one-pack-a-day habit, and approximately 40 for a two-pack-a-day habit. Examples 3 and 8 in the Appendix describe other studies with similar gradients.

D. Coherence (Biological Plausibility)

This criterion is concerned with how the apparent cause-and-effect relationship fits with other knowledge. Also referred to as *biological plausibility*, it is sometimes difficult to apply or interpret. It may be as simple as observing that an ingested or inhaled substance is most likely to affect the first organ it encounters — the stomach or the lung. Or it may involve extrapolating from animal data.

Unfortunately, with ingenuity, one can almost always find a plausible explanation for whatever is observed. Thus plausibility is often of little help in sorting out convincing from unconvincing data. At the other extreme, one has to remember that if repeated studies show a clear and highly consistent effect, even implausible results should not be ignored, as they may well be an entirely new discovery. Example 5 in the Appendix involves this criterion.

E. Temporal Relationship

At a very elementary level, this is as simple as saying that a cause must precede an effect. However, there are situations when this is not entirely obvious, such as in “cross-sectional” studies, where the possible cause and effect are both measured at the same time.

The issue of time can be very important in diseases that normally show a long latent interval between exposure and development of symptoms. Cancer is a typical example, with a latent interval of often 15 to 20 years between first exposure and diagnosis. If a study appears to show a high rate of cancer only in individuals who have been employed for, say, less than five years, there would be considerable doubt whether a causal relationship truly existed.

F. Specificity

At its simplest, this means “one cause, one effect.” However, things are not always that simple. Indeed, one of the reasons that the link between cigarette smoking and lung cancer was initially greeted with skepticism is that smokers appeared to develop excess cancers in other organs, as well as an excess of non-cancer diseases such as chronic bronchitis.

This criterion is particularly useful where the author has supplied information on observed/expected figures for a variety of causes, including such things as heart disease, accidents, pneumonia, etc. It would be unusual, although not impossible, to find that a workplace exposure increased the rate in *all* these different categories. It is more usual to see a main effect in one category or type of disease, and possibly one or two less strong effects, rather than the entire spectrum of human disease.

In passing, it should be pointed out that the characteristic of specificity is at the heart of the use of the Proportional Mortality Ratio (P.M.R.) described in Section 4. This method depends on the assumption that most causes of death will be the same as usual, and that the excess will be seen in only one or two categories.

The other aspect of specificity lies in the exposure itself. Thus the initial concern about an occupational problem may arise in the context of a particular industry or plant. In the beginning, the connection may seem rather weak. However, if there is a true relationship between exposure and effect in one part of the plant but not in others, it becomes clear as the investigation continues that there is a high relative risk in one area and a normal relative risk of about 1 in the rest. The initial impression of a weak relationship was due to the dilution of the effect of the toxic area by the non-toxic areas. Example 3 in the Appendix illustrates this.

G. Statistical Significance

This criterion often causes difficulties for the reader who is used to the idea of mathematical certainty in science. In an epidemiological study, the statistical significance of the findings usually depends on two things: the strength of the association and the number of observations.

Thus a study based on very few people will probably not show statistical significance even though there is truly a relationship between cause and effect. At the other extreme, virtually any study involving very large numbers of people will show even the smallest difference between the two groups to be statistically significant in a strictly mathematical sense. Example 1 in the Appendix deals in part with this issue.

As with all these criteria, the importance attached to statistical significance is not an “all-or-none” phenomenon. Rather, it must be taken into account together with other criteria, especially the strength of association.

Finally, it should be re-emphasized that these criteria are guidelines only, not inflexible rules.

Glossary

This glossary is deliberately short, and is limited in scope. More detailed information on epidemiological terminology and methods can be found in books such as:

- *A Dictionary of Epidemiology* (Edited by J. Last) Oxford University Press, 1983.
- *Research Methods in Occupational Epidemiology* (Checkoway et al.) Oxford University Press, 1989.
- *Occupational Epidemiology* (R.R. Monson) C.R.C. Press, 1987.

For simplicity, it is assumed that the following terms are used in reference to a comparison of illness frequency in a group of “exposed” workers and in a group of people of similar sex, age, etc., who are not exposed.

.....

Attributable Risk: The number or proportion of cases that can be attributed to the exposure. In the example given below under the heading *Relative Risk*, 25 observed cases occurred in an exposed group *divided by* 10 expected, giving a relative risk of 2.5. The attributable risk for this group is the extra 15, that is, the observed *minus* the expected. This can also be expressed as a proportion. In this case, since 15 out of the 25 observed cases are presumably due to the exposure, the attributable risk is 15 divided by 25, or 60%. In this group of 25 workers, 60% have developed the disease as a result of their work.

Case-Control Study: The analysis begins with cases of the disease of interest and a control group of people who are similar to the cases, except that they do not have the disease. The past experience of cases and controls is then compared by interview, questionnaire, or examination of old records. Sometimes called *retrospective* or *backward* study.

Cohort: The word *cohort* is derived from the Latin for a unit of the Roman legion. In those days a cohort consisted of a group of men whom all originated from the same village or district. In epidemiology it has been adopted as a useful piece of jargon to mean a group of individuals with some common characteristic. The characteristic may be the same as in Roman times — origin from a particular location — or it may mean similar type of work, plus age and sex (for example, male bakers in the age group 45 to 49).

Cohort Study: The analysis begins with healthy people in both the exposed and the unexposed group. Disease frequency is recorded over a subsequent period of time — days, months, or years, depending on the disease. Also called *prospective* or *forward* study.

Confounding Variable: See *Variable*.

Control Group: In an experimental study or randomized controlled trial, the control group is the group of unexposed individuals. In a case-control study, the controls are a sample of people without the disease being studied.

Dependent Variable: See *Variable*.

Disease: May be used in the very broad sense of *dis-ease*, i.e., interfering with usual life. Can therefore be either illness (such as asthma or cancer) or a result of trauma (such as a broken bone).

Experimental: The investigator has complete control over the allocation of individuals to the experimental and control groups. It is therefore possible to use strictly random allocation to ensure appropriate balancing of factors that may influence susceptibility.

Exposed: Used in the broad sense of exposure to danger — either chemical or accident (trauma).

Incidence Rate: The number of new cases of disease occurring over a certain period of time per unit of population, such as 4 per 1,000 per year.

Independent Variable: See *Variable*.

Mutagenic: A widely held theory of cancer causation is based on damage to the D.N.A. in cells. D.N.A. is involved in reproduction of the cells — and of the whole animal. Some tests of possible cancer-producing chemicals are based on whether or not they affect the frequency of abnormal offspring due to “mutations.” If they do, they are probably also “carcinogenic,” i.e., capable of causing cancer.

Odds Ratio: Estimate or equivalent of relative risk. Used mainly in case-control studies.

Population: Used in epidemiology not only in the sense of “the population of Canada” but also in the sense of a particular group of individuals being studied, such as foundry workers, all the hourly-paid employees of a company, etc.

Prevalence Rate: The number of existing cases of disease at a certain point in time, expressed per unit of population, such as 12 per 100,000. See also *Incidence Rate*.

Prospective: See *Cohort Study*.

Randomization: The “blind” allocation of individuals to the exposed or unexposed group. Used in experimental studies to balance out confounding variables that may be known or unknown. See also *Stratification*.

Relative Risk: Observed number divided by expected number. For example, 25 cases in a population where only 10 would normally be expected gives a relative risk of 2.5 (25 divided by 10).

Sensitivity: The ability of a study to detect a real difference between the groups. If there is low sensitivity, the result may be a “false negative.”

Signs: Deviations from normal that can be observed by the examiner. Examples include obesity, pale face, tenderness to pressure at a certain point, pulse rate, a lump, etc.

S.M.R.: Standardized Mortality Ratio, equivalent to relative risk (observed cases divided by expected cases). Usually expressed as a percentage. Used where the general population acts as the unexposed control group.

Stratification: Analyzing results according to various characteristics that might be confounding the analysis. For example, in a study of lung cancer in asbestos workers, the analysis should include stratification by smoking status, to see whether the asbestos effect alone is the same in non-, light, or heavy smokers, or whether there is a multiplicative effect of the two exposures. Also used in experimental studies before randomizing subjects.

Symptoms: Things that the patient complains of and for which there may be no external signs, such as pain, depression, etc.

Syndrome: A group of symptoms and/or signs that seem to occur together more often than would be expected by chance, yet are not defined clearly enough to receive a specific diagnostic title.

Trauma: External cause of tissue damage. Commonly used in the sense of, say, a broken bone due to a fall.

Variable: Usually a disease, an occupational exposure, or some other factor. The exposure is called the *independent* variable, while the disease is the *dependent* variable. Other factors such as diet, smoking, etc., are *confounding* variables, since they often confuse the issue and make it difficult to decide whether there is a true cause-and-effect relationship between the exposure and the disease.

Appendix

The following examples of the scientific evaluation of job/disease relationships are all based on actual studies. In some cases, the numbers have been changed slightly in order to simplify the data.

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1. Most of the criteria of causality are met. Example: cancer in rubber workers.

Three separate studies were carried out in groups of rubber workers exposed to the same types of chemicals. The results for three types of cancer are shown in the following table:

	A			B			C		
	Obs	Exp	S.M.R. <i>95% C.I.</i>	Obs	Exp	S.M.R. <i>95% C.I.</i>	Obs	Exp	S.M.R. <i>95% C.I.</i>
Stomach	39	20.9	187 <i>134-255</i>	98	93.9	104 <i>85-127</i>	34	27.6	123 <i>85-171</i>
Lung	91	109.3	83 <i>67-102</i>	234	253.1	92 <i>80-106</i>	116	139.8	83 <i>69-99</i>
Leukemia	16	12.5	128 <i>73-208</i>	48	38.9	123 <i>91-163</i>	25	18.1	138 <i>89-204</i>

Observed and Expected deaths from 3 types of cancer,
with Standardized Mortality Ratios.

Expected deaths are based on death rates in the general population
95% C.I. = 95% Confidence Interval of the S.M.R.

The three plants where the study was carried out are labelled A, B, and C. The ratios of the observed versus expected deaths are elevated for both stomach cancer and leukemia, especially the latter, where the S.M.R. is elevated at a fairly similar level in all three cases. For stomach cancer, the S.M.R.s vary widely, from 104 to 187. By contrast, lung cancer results are all on the low side, with S.M.R.s of 83, 92, and 83.

Beneath each S.M.R. figure, the 95% confidence interval of the S.M.R. is printed in italics. This is a relatively new way of expressing statistical significance in medical studies. Where the limits of the confidence interval *do not include* the figure 100 (= a relative risk of 1), the result is "statistically significant." The same conclusion used to be stated in the form, "significant at the 5% level."

Confidence intervals have replaced simple cut-off figures for statistical significance because they provide a better idea of how wide the range of uncertainty is. Thus for leukemia in location A, although the S.M.R. is 128, the confidence interval covers a very wide range, from 73 to 208. This reflects the fact that it is based on the relatively small number of 16 observed cases. By contrast, the S.M.R. for lung cancer in location B, based on 234 cases, is 92 with a much tighter confidence interval of 80 to 106.

Both stomach cancer and leukemia show consistency in that all these results are above normal and, in the case of leukemia, of approximately the same magnitude. However, this set of results is not entirely convincing because of the lack of statistical significance in most of the results. Only one of the S.M.R.s — stomach cancer at location A — is statistically significant, because the lower limit of the interval is 134, well above the baseline value of 100.

There is a growing tendency to combine the results of different studies in order to achieve larger numbers and thus narrower confidence intervals around the S.M.R. This is explored in the next example.

In passing, it should be noted that although S.M.R.s have traditionally been expressed as a percentage (100% is equivalent to a relative risk of 1), there is an increasing tendency for them to be reported also as a simple ratio — 1.25, 3.9, etc. This has the advantage of emphasizing the similarity to relative risk. However, since most of these examples are from publications using the old percentage format, we have adhered to that format in most cases.

2. “Meta-analysis” — combining studies to increase accuracy and reliability.

In Example 1, the findings for both stomach cancer and leukemia were very suggestive, but the statistical significance was not impressive for most of them. In the following table, the same set of data is combined in the final column under the heading of “Total,” to give the basis for what is now usually called a *meta-analysis*.

	A			B			C			TOTAL		
	Obs	Exp	S.M.R. 95% C.I.	Obs	Exp	S.M.R. 95% C.I.	Obs	Exp	S.M.R. 95% C.I.	Obs	Exp	S.M.R. 95% C.I.
Stomach	39	20.9	187 134-255	98	93.9	104 85-127	34	27.6	123 85-171	171	142.4	120 103-139
Lung	91	109.3	83 67-102	234	253.1	92 80-106	116	139.8	83 69-99	441	502.2	88 80-96
Leukemia	16	12.5	128 73-208	48	38.9	123 91-163	25	18.1	138 89-204	89	69.5	128 103-157

Observed and Expected deaths from 3 types of cancer,
with Standardized Mortality Ratios

Expected deaths are based on death rates in the general population.

95% C.I. = 95% Confidence Interval of the S.M.R.

The “TOTAL” panel illustrates the effect of combining studies
A, B and C (= “meta-analysis”)

For both stomach cancer and leukemia, the combined figures are now statistically significant, with the lower level of the confidence interval being above 100 in each case. Furthermore, the width of the confidence interval is considerably less than that seen in some of the individual studies. The stomach cancer interval is 36 (103 to 139), while the leukemia interval is 54 (103 to 157).

The meta-analysis also clarifies the lung cancer issue, with an S.M.R. of 88 and a very narrow confidence interval of 80 to 96. Thus for lung cancer even the *upper* limit is below 100, indicating that there is very little probability of a true increase in lung cancer. However, the healthy worker effect tends to affect even cancer to some extent, so that these S.M.R.s may be underestimating the true relative frequency of lung cancer. Even so, it is unlikely to be more than a few points above the normal of 100, and for practical purposes this is well within the normal variation seen in human populations. These studies therefore indicate that if any lung cancer is being caused by this particular industrial process, the numbers are very small compared to the normal background of lung cancer in the population.

In addition to the healthy worker effect, it is always important to bear in mind that the control group being used may not be appropriate. Thus in the examples of locations A, B, and C, the total population death rates for the United States were used as the basis for calculating expected figures. One would think that a more appropriate reference point would be the population of the area in which the plants were located. Unfortunately such data are not always easily available. Even if they are, they are not based on such large numbers as the entire U.S. population, and are therefore less reliable as a yardstick against which to compare the rates within a particular industry.

In fact, however, the use of the U.S. population in this case probably increased the accuracy of the S.M.R.s. The reason for this is that all three locations were in the northeast United States, where cancer rates tend to be higher than in the U.S. as a whole, perhaps because this is where most chemical and other potentially toxic industries are located. It can therefore be argued that the general U.S. population is a better comparison group than the local population, because it has a relatively “clean” environment.

This example shows that although intuitively the local population would seem to be the most appropriate one from which to get the expected figures, this may in fact weaken the apparent association between an industry and a disease.

3. Locating the hazardous area.

Example: rubber workers and coke oven workers.

It is not uncommon for studies of certain industries to reveal a consistent pattern of elevated S.M.R.s although none of the S.M.R.s is very high. In Example 2 combining the smaller studies resulted in a meta-analysis figure that was clearly above 2 and was also

statistically significant for two of the three cancers. There are, however, situations where after several studies the overall S.M.R. for an industry is only, say, 1.5. This means that the disease in question is occurring 50% more often in the workers than in the general population. If 15 workers develop the disease, 5 of the 15 cases are due to occupation while the other 10 are the normal background for the population. Which of these cases are the ones “more likely than not” to be due to their occupation?

If the industry in question has a number of different process areas, the next step is to break the analysis into a number of smaller parts, with each part corresponding to a different area of the plant, or a different part of the manufacturing process.

Let us examine the findings for stomach cancer from Example 2. When the plants as a whole were subdivided, it was found that in most areas of production, the S.M.R. for stomach cancer was not greatly elevated above normal. In one particular area, however, where raw materials were mixed and there was a good deal of dust in the air, the S.M.R. was 390. In other words, the overall figure of 120 (R.R. = 1.2) for the industry was being caused almost entirely by one area’s much higher rate of 3.9 times the normal incidence of stomach cancer. The low overall figure was due to dilution of this high rate by inclusion of people from uncontaminated zones.

From a compensation point of view, this type of information can obviously be very important. This is because with a relative risk of 3.9, a case of stomach cancer would carry an attributable risk of approximately 75% if the individual had spent his or her working life in the high-risk area.

Ideally, the compensation decision should also take into account the duration of exposure, the level of contamination during the years that the worker was exposed, and the latent interval between the start of work and development of the cancer. In this way a graduated decision process can be used to deal more appropriately with the variation in risk between people who had worked in the toxic area for varying lengths of time. This issue is examined later in this Appendix, in Example 8.

Another example of more precise location of a toxic area can be found in a large study of workers in coke plants associated with steel making. For the total coke plant, the relative risk of lung cancer was found to be 2.1. For the men working around the coke ovens, it was found to be 3.6. However, among men who worked topside on the coke ovens and were therefore more heavily exposed to the fumes that came out of the ovens when they were opened for recharging, the relative risk was 10 if they had worked at this job for five or more years.

As a side issue, it may be noted that this study also demonstrated a dose-response effect. Men who had worked for *more* than five years had a relative risk of 10, but those who had worked *less* than five years had a relative risk of only 2.9.

Example 7 describes yet another example of hazard location, using a “nested” case-control study.

Finally, it should be pointed out that even after focusing down on different areas within a plant, the highest relative risk may be only 1.5. On the face of it, this would mean that the “attributable risk of occupation” is only 33% ($0.5/1.5$). This is well below the “equal possibility” level of 2. However, if the figure of 1.5 were obtained in several different plants, and if the confidence interval was very narrow — say, 1.4 to 1.6 — it would indicate that there was good reason to believe that one third of all these cancers were due to the exposure. The decision on how to deal with this in a fair manner is complex, because the choice would appear to be between compensating all cases — thus being unfair to society at large — and compensating none — which would be unfair to the workers who had truly suffered from their occupational exposure.

It is outside the scope of this protocol to discuss possible solutions to this dilemma, but it should be emphasized that diseases of occupational origin often do not carry a “fingerprint” that can be used to separate them from those that are non-occupational. Further, the dilemma could conceivably be even more severe — for example, a relative risk of 1.05 with a confidence interval which was very narrow — say 1.04 to 1.06 — would indicate an occupationally attributable risk of only 4.8% ($0.05/1.05$), and a corresponding 95.2% probability of *non*-occupational origin.

4. Healthy worker effect, S.M.R. and S.P.M.R. studies.

Almost invariably, when the general population is used as the basis for calculating expected numbers of deaths, the S.M.R. for any disease tends to be below 100, i.e., below normal frequency. This is known as the *healthy worker effect*, a term that reflects the belief that the reason behind this abnormally low figure is that only healthy people are able to join the work force, while the less healthy remain at home and — so it is assumed — die earlier.

However, the situation is not as straightforward as it may seem, since the healthy worker effect is also seen to some extent in things such as cancer, heart attacks, motor vehicle accidents, etc., where “employment of the fittest” would seem unlikely to be a factor. There are various theories to explain this and there is not enough space here to discuss them at length. The purpose of this example is to illustrate that the use of the Proportional Mortality Ratio (P.M.R.) essentially eliminates the healthy worker effect. In fact, it may *overcompensate* in some cases.

A study involving over 13,000 workers in the rubber industry found that during the period of follow-up there were 5,079 deaths from all causes. Forty-eight deaths were from bladder cancer and 255 deaths were from respiratory cancer. Most of these respiratory cancers would have been lung cancer.

Based on death rates in the total U.S. population, and after adjusting for age and sex, the expected number of deaths from all causes would have been 6,090.6; from bladder cancer 39.5; and from respiratory cancer 293.4. When each of the observed number of deaths is divided by the expected number, the corresponding S.M.R.s are: all causes of death, 83; bladder cancer, 122; respiratory cancer, 87.

It has been suggested that one way to minimize the healthy worker effect for individual causes of death is to divide all the individual disease S.M.R.s by the S.M.R. for all causes. The idea here is that by making an overall allowance for the general underestimation of causes of death, we would remove the bias due to the healthy worker effect (this assumes that the effect is the same size for each cause of death — which may not be true).

If the bladder cancer S.M.R. of 122 is divided by 0.83 to allow for the all-cause healthy worker effect, the bladder cancer S.M.R. increases to 147. Similarly, if the respiratory cancer S.M.R. of 87 is divided by 0.83, it becomes 105. If proportional mortality ratios are calculated from these same numbers, the resulting S.P.M.R.s are exactly the same as these “corrected” S.M.R.s.

The calculation of the S.P.M.R. for bladder cancer consists of two stages:

- First, the observed and expected proportions are calculated. For the observed deaths, the proportion is $\frac{48}{5079}$, or 0.00945. For the expected deaths, the figure is $\frac{39.5}{6090.6}$, or 0.00649.
- The second stage is to divide the observed by the expected proportions. This gives a figure of 147 for the S.P.M.R. — identical to the “corrected” S.M.R. of 147. The reason for this is that the same numbers are used in each set of calculations, and it assumes that the all cause Healthy Worker Effect is appropriate for individual diseases such as bladder cancer. In practice (see below) the Effect is usually different for different diseases.

By basing the calculations on *proportions* of deaths, we remove the element of underlying *population* numbers. Thus, we effectively allow the ratios to depend simply on the numbers of deaths, ignoring the issue of the normal *rates* in the population.

This approach to the healthy worker effect is not entirely satisfactory, but then neither is any other because the size of the healthy worker effect tends to vary between different causes of death and depends to a large extent upon which age group is being studied. The reason for the age effect is that some causes of death, such as motor vehicle accidents, are very high at younger ages particularly in men, while diseases such as heart attack and cancer become overwhelming in their importance at later ages.

One of the main weaknesses of the proportional approach is that in its simplest form it is based on the assumption that all other causes of mortality *except* the one of interest are the same as in the reference population. To take an extreme example, if the occupational group had twice the death rate in *all* diseases as that of the general population, a proportional analysis would not reveal this, since each disease would still be present in the same relative proportion. For this reason, investigators often carry out extra proportional analyses using groupings other than total deaths as the denominator.

For example, it may be suspected that the occupational group is unusual in its mortality from such things as heart disease and accidents, which will distort the S.P.M.R. As an alternative, we can use “all cancers” as the basis for the proportional analysis. Thus, for bladder cancer we would divide the 48 observed deaths by the total of 986 deaths from all types of cancer, and get a figure of 0.0487. Doing the same thing with the expected deaths, we would divide 39.5 expected deaths from bladder cancer by 1,064.9 expected deaths from all cancers, and obtain a figure of 0.0371. When we divide the observed proportion by the expected proportion and multiply by 100, we get an S.P.M.R. of 131, compared to 147 using all causes (this difference is due to variation in the size of the Healthy Worker Effect in cancers versus non-cancers, as described above).

Further, it is well known that cigarette smoking can cause both lung cancer and bladder cancer. This may make us uncomfortable about using the all-cancer basis for calculating the S.P.M.R., since the smoking pattern in the employees may be different from that in the general population. We can therefore go one step further in selecting our basic group for comparison by using “all cancer deaths except those from respiratory cancer.” The observed 48 deaths for bladder cancer would be divided by 731, giving a figure of 0.0657. Similarly, the expected figure is $39.5/771.5$, or 0.0512. Dividing observed by expected now gives an S.P.M.R. of 128, which is quite close to the figure of 131 that we got using all cancers as the reference group.

Another refinement that we may wish to apply is to take out of our denominator the deaths due to the cause we are interested in. It can be argued that by dividing the 48 bladder cancers by the figure of 731 we are underestimating the ratio because we suspect that the bladder cancers themselves are already more numerous than normal. The next step, therefore, is to use as the denominator “all cancer deaths except those from respiratory cancer and bladder cancer.” When we do this, the resulting S.P.M.R. is 130, rather than 128, so that removing the bladder cancers has indeed had the effect of removing the “dilution” of the denominator. However, the change is quite small.

At the end of all these calculations, it seems that a figure of approximately 130 is likely to be fairly close to the “truth,” lying midway between the original S.M.R. of 122 and the all-cause S.P.M.R. of 147.

As a matter of interest, the same set of calculations can be carried out for respiratory cancer. When the denominator “all cancer deaths except those from lung and bladder cancer” is used, the S.P.M.R. is 93, again somewhere between the original S.M.R. of 87 and the all-cause S.P.M.R. of 105.

5. Where consistency (reproducibility) is weak because there is only one study. Example: roe “poppers.”

There are frequently situations where an unusual type of job is suspected of causing disease. For example, “popping” of herring roe is an occupation that is probably unique to British Columbia. If workers report symptoms in their hands and arms, it may be decided that a study needs to be done to identify the problem and see if it is in fact increased by this occupation.

But if an association is found between the job and the syndrome of repetitive strain injury, how can we overcome the problem posed by the absence of any other studies in other parts of the world with which we can demonstrate the criterion of consistency?

There are at least two ways of dealing with this situation:

- If the study is strong enough in other criteria, it may be adequate as a basis for decision making, even though there are no other such studies.

For example, there may be a high relative risk (strength of association); it may be statistically highly significant; and there may be a dose-response relationship in that workers using a very stressful technique may show a higher frequency of disease than those using a less stressful technique. Further, there may clearly be specificity, with all or most of the workers complaining of a single specific type of problem, not a broad mix of various aches and pains.

Finally, coherence (biological plausibility) may be seen in the fact that the same types of signs and symptoms occur in other jobs involving similar movements of the hands and arms. If this were so, it would support the idea that this study of roe poppers is not a fluke, but rather what would be expected on the basis of other studies.

- The other option is to carry out a second study in a subsequent season. The same study design, tests, etc., can be used, but possibly a different group of employees.

This option is potentially expensive, and would delay decisions being made on compensation issues. On the other hand, the study might be worth doing again anyway, because the results of the first study may indicate a need for

improvement in the definition of a “case,” the type of test used, etc. Further, a second study may help not only to demonstrate reproducibility but also to define more precisely the criteria for deciding whether any individual claim should be accepted or rejected.

6. A case-control study of nasal cancer in wood-workers.

In a case-control study, the investigation begins with a group of individuals who are suffering from the disease of interest. Earlier studies in different parts of the world had shown that people who are exposed to large amounts of dust from hardwood, such as in furniture making, are at an increased risk of cancer within the nose and the nasal sinuses. A few years ago, a study done in Washington state sought to answer the question whether persons exposed to softwood dust also had an increase in this type of cancer.

Twenty-seven cases were identified from the records of the local cancer registry. For each case, two controls of the same age and sex were obtained from the general population by a telephone technique called random digit dialing.

A detailed occupational history was obtained for each person. Smoking, alcohol consumption, and other life-style factors were also recorded. Seven of the cancer cases had a history of working in wood dust; in each case, it was softwood dust in logging operations or construction. None had worked in furniture making. The estimated relative risk was 2.4 (2.350 to be exact). Note that in a case-control study the determination of relative risk is not made by simply comparing the frequency of an exposure history in the cases and controls. Rather, it involves calculating “cross-products,” as illustrated in table (a).

(a)

		Nasal	Cancer?	Total
		Yes	No	
Ever worked in wood industry?	Yes	7	14	21
	No	20	94	114
Total		27	108	135

Odds Ratio by “cross-products”

$$(7 \times 94)/(20 \times 14) = 2.350$$

(b)

		Nasal	Cancer?		
		Yes	No	Total	per 100,000
Ever worked in wood industry?	Yes	7	14,000	14,007	50.0
	No	20	94,000	94,020	21.3
Total		27	108,000	108,027	

Relative Risk

$$50.0/21.3 = 2.347$$

The cross-products of the “2 x 2 table” gives $(7 \times 94)/(20 \times 14)$, for an estimate of 2.347.

This is an estimate rather than an exact measurement, as in the case of a cohort study, because the “No” column represents only a *sample* of the normal population. Furthermore, the cross-products method is based on the assumption that the number of cases is so small compared to the total population that it can be ignored.

To illustrate these points, we can multiply the numbers under the “No” heading by 1,000, as shown in Table (b), and then work out the relative risk in the usual cohort way by comparing the *rate* of cancer in the exposed and unexposed population. When this is done, a relative risk (S.M.R.) of 2.35 is again obtained. The same result is obtained if we multiply the figures by 10,000 or 100,000 instead of 1,000. (See also Example 12.)

7. A nested case-control study of mesothelioma in asbestos workers.

Possible differences in the frequency of a powerful confounding variable can cause uncertainty about whether findings of an elevated cancer risk are distorted. Probably the most frequent use of the nested case-control study is to remove this uncertainty.

In Example 3 topside coke-oven workers were found to have a much higher risk of lung cancer than other workers. It might be argued that perhaps this was actually due to a higher proportion of heavy smokers in this group. By finding out the smoking habits of the topside workers and comparing them with a matched sample of a similar number of workers from the rest of the cohort study, this question can be answered at much less cost than by trying to get detailed smoking information from all the thousands of workers who make up the cohort.

Another use of this type of study is in detecting a small problem that might otherwise be missed. In a large British study, a group of asbestos workers were followed up in a cohort study. Follow-up took place over approximately 40 years, during which there were over 1,600 deaths. The initial analysis revealed no particularly elevated risk for respiratory cancer (S.M.R. of 1.08). However, it was noted that according to plant records, there had been a brief period during which the plant used a form of asbestos called crocidolite. This has a strong tendency to cause a rare tumor of the lung lining called mesothelioma. When the mortality records were examined, it was found that there had been 10 cases of mesothelioma. These 10 cases were each matched with 4 controls from the same work force, according to sex, year of starting work in the factory, year of birth, etc.

Of the 10 cases of mesothelioma, 8 had had definite exposure to crocidolite. In the 40 controls the corresponding figure was 3, leading to an estimated relative risk of 49 — a very high figure.

8. Attributable risk. Example: Bladder cancer in aluminum smelter workers.

For many years, the “balance of possibilities” guideline in compensation decisions has meant in effect that the relative risk of a disease being due to a certain occupation must be at least 2 for the worker to get the benefit of the doubt. This has often been a *qualitative* rather than quantitative judgment. However, with the increasing availability of actual numerical estimates of relative risk from epidemiological studies of occupational disease, this approach is being refined.

If enough information is available on the total “dose” of a toxic agent — in terms of either duration of exposure or intensity — a system can be developed that combines these factors. Decisions on compensation can be individualized better than if they have to rely simply on whether an overall relative risk for a certain occupation is greater than or less than 2.

For example, in a study of bladder cancer in workers in aluminum smelter pot-rooms, it was found that the frequency of bladder cancer was related quite closely to the product of “average dose *times* years of exposure,” with dose being the concentration of Benzo-a-Pyrene in the urine of the workers. It was then possible to estimate a dose-response equation with which the cut-off point for compensation could be based on an individual’s risk, rather than on the overall risk for the whole group of workers.

This approach promises to make compensation decisions more sensitive to individual variation in exposure, and thus increase the fairness of the process.

9. The risk of picking the wrong control group.

To estimate the relative risk for a group of workers in an occupation suspected of being toxic, we can use as our control group either the general population or a group of workers who appear to be similar but are not exposed to the toxic agent. The latter is intuitively more attractive, since it should not only get rid of the healthy worker effect but might also remove some other confounding variables.

In practice, however, there may be problems. The main one is the instability of the *expected* numbers due to relatively small size of the control group compared to the much larger general population. The number of expected cases may therefore fluctuate widely from year to year.

A second problem, which fortunately does not occur often, but which is more serious than the random error due to small numbers, is *systematic* error or bias. An example of this occurred in a study of workers in an industry who were exposed to a known carcinogen. A group of unexposed workers was used as the control group. Surprisingly, compared to the control group, the *exposed* workers were found to have very *low* cancer rates. However, comparisons with the general population were also being carried out in the same study, and it quickly became apparent that the *unexposed* group was experiencing an abnormally *high* rate of certain types of cancer, possibly because of airborne dust that had not previously been suspected of being carcinogenic.

The *expected* cancer rates in the exposed workers were therefore much *higher* than they should have been, resulting in an abnormally low ratio of observed to expected.

In this case, the inappropriateness of the first control group was soon realized, and no erroneous conclusions were drawn about the first group of “exposed” workers. However, this example shows that in any ratio of disease frequencies, both groups — exposed and control — must be appropriately selected, and, if possible, more than one control group should be used.

10. Cross-sectional study. Example: vibration white finger disease in fallers.

Most of the examples in this protocol are based on death rates from fatal cancer of various organs. This is partly a reflection of the fact that more serious diseases are studied more often, and also of the fact that for many years fatal diseases have been much *easier* to study than non-fatal problems. This is because of more reliable records — death registration is a compulsory matter, and a death is less likely than a chronic, non-fatal disease to be counted more than once.

The characteristic feature of cross-sectional studies is that the physical abnormality (or complaint) is measured in a group of living persons, and the degree of exposure can be assessed at the same time. The main theoretical difficulty with these studies is that there is no way of knowing whether the “cause” actually preceded the disease (the criterion of temporal relationship). However, this is usually not a major problem once the control group has been studied.

Vibration white finger disease in fallers provides an example of a disorder that could not be analyzed by mortality statistics, and which needed a specially designed study to define and then identify “cases.” The cases could then be compared to a group of normal individuals to see what factors influence the occurrence and severity of the white finger disorder.

In a B.C. study, it was found that duration of employment as a faller was an important factor, and that the problem could not be blamed on differences in smoking (a powerful vasoconstrictor) and other personal habits or characteristics. One important and useful feature of this study was its demonstration that the symptoms of tingling, numbness, pallor, etc., in the fingers could also be elicited by an *objective* test involving the deliberate cooling of the hand, followed by a measurement of the rate at which the fingers warmed up.

This ability to demonstrate an objective, measurable change makes diagnostic decisions much easier than if all the manifestations of the disease are subjective — such “unprovable” things as pain, discomfort, etc.

11. Case-reports and clusters. Example: a chance cluster of cancers.

In the medical literature a *case report* is a very brief article that simply reports the occurrence of one or more unusual cases. Case reports often lead to properly designed epidemiological studies that reveal a cause-and-effect relationship in a workplace. On the other hand, the observations sometimes turn out to be nothing more than a coincidence, and an epidemiological study reveals that no excess risk applies.

An example of a very useful case report was one regarding three cases of a rare liver tumor called angiosarcoma. The fact that the tumor was normally so rare, combined with the fact that all three of the victims came from the same chemical plant, drew attention to the issue. A subsequent epidemiological study showed that the men involved had been exposed to vinyl chloride monomer in high concentrations for several years. Epidemiological studies confirmed that the relative risk for liver cancer was very high in men who were exposed to vinyl chloride. There was also an excess of cancers of the brain and lung, but these were not very large. In any event, regulations

governing exposure to vinyl chloride were changed. Exposure to this previously unsuspected toxic substance was reduced to the point where excess cancers in workers have now disappeared.

Clusters are similar to case reports in that they are typically a small number of cases of a certain disease that have occurred within a small geographical area over a relatively short period of time. As with case reports, the identification of clusters has, on occasion, led to the uncovering of a clear-cut occupational relationship to disease increase.

Indeed, case reports are usually a form of cluster that has been observed by a physician and that then forms the basis for a contribution to a medical journal. In recent years, the term *cluster* seems to have been used most often by the media, usually involving situations such as the occurrence of three or four cases of a disease within a few weeks of each other where none had been seen for perhaps 10 years before. If this occurs in a workplace where a new process has recently been introduced, there is the natural suspicion that the sudden appearance of illness in several workers may be related to the new environmental problems posed by the new work process.

An example of a cluster that attracted a great deal of media attention but which was later found not to be occupationally related occurred in a police building in British Columbia. Several cases of cancer were noted in people who were working in the building, or who had worked in it until shortly before their cancer appeared. Although the occupations in the building were mainly secretarial in nature, there was concern about possible indoor air pollution, and also about the presence of an unusual amount of equipment that could be generating electromagnetic fields.

The investigation of this situation followed two parallel routes. First, air and dust samples were taken from various rooms and analyzed for known carcinogens. They were also added to preparations of cells to see if the substances had any mutagenic or carcinogenic effects on the cells. The second approach was to obtain a complete list of individuals who had ever worked in the building. The individuals were traced to see whether they were alive or dead, and if dead, to find out what they had died from. Those who were still living were asked to complete a questionnaire with particular emphasis on whether or not they had ever been diagnosed with any form of cancer.

The results of the environmental sampling were entirely negative. No mutagenic or carcinogenic substances were found in the environment, and the amount of electromagnetic radiation was small.

Initially seven cases of cancer were reported, six of which were among full-time regular staff. Contract and part-time staff were difficult to trace, so the study concentrated on the regular staff members, among whom 174 individuals had spent time in the building. The six previously reported cancers were confirmed and two other cases of cancer were found in the detailed follow-up.

The first point that was noted about the cancers was that all eight were of different organs. Although specificity is not a very strong criterion of causality, this clearly did not fit with it. The next most obvious criterion that was not met was the amount of time spent in the building before the diagnosis of cancer. One case had worked in the building for 9 years, but the other seven cases had spent less than 5 years in the building before their cancer was diagnosed. The fact that the great majority of cancers take at least 10 to 15 years to develop after exposure begins was therefore a second argument against there being a causal relationship between the building environment and the cases of cancer.

When a traditional epidemiological analysis was undertaken, in which the number of cancers observed was compared with the number expected given the age and sex distribution of the 174 individuals, the relative risk was approximately 2.5. However, if a minimum 10-year latency was assumed, the number of observed cases dropped to 2 and the expected cases to 1.75, for an S.M.R. of 1.12. In other words, provided that the usual minimum 10-year latency period was applied, there was very little difference between the number of cancers observed and the number expected.

Combined with the failure to find any sort of known carcinogenic substance in the environment, the conclusion was that this was a coincidental occurrence of several cases of cancer in an unusually small geographical area and short period of time.

This example emphasizes the difficulty in dealing with chance clusters of diseases such as cancer. As a useful analogy, consider the probability that the first four cards to be dealt from a pack of cards will all be aces. In an emotionally charged poker game, this might well be the precipitating cause of violence. However, the fact is that such a combination is bound to occur by chance sooner or later. The exact probability is quite easy to work out: $52 \times 51 \times 50 \times 49$, or once in every 6.5 million deals of a standard pack of cards.

When one considers that approximately 20% of all deaths are due to cancer, it is obvious that in a country the size of Canada, there is a strong likelihood that in any group of 50 or 100 people an apparent cluster of cancer diagnoses will occur once every few years. However, since this type of cluster is occasionally an early warning signal of a hazardous workplace, each cluster must be investigated, unless there is already in place a routine mortality surveillance program that can provide evidence of whether or not there is a genuine increase in occupational disease.

12. Small numbers can sometimes give impressive results. Example: infertility.

Studies of occupational disease can often be frustrating, because the ability to draw a firm conclusion is weakened by the small numbers in the analysis even though the size of the groups being studied is very large. For example, there may be only 10 observed cases of a potential disease in the exposed group compared to 7 expected, even though tens of thousands of workers are being studied.

Where the effect is very dramatic, however, the difference (relative risk) may be so large that a cause-and-effect relationship is obvious, even with very small numbers.

For example, a few years ago some workers in a particular area of a chemical plant mentioned to the company doctor that they seemed to be unable to have children. Their complaints were investigated, and it was found that out of the 22 men in this department, 11 had abnormally low sperm counts.

As a first step, the information on the 22 workers was divided according to whether or not they had abnormal fertility (abnormally low sperm count), and then subdivided according to duration of employment in this part of the plant. The results are shown below in Table (a), a “2 x 2 table.” This is therefore essentially a simple case-control study, since the *initial* step was to identify the individuals on the basis of whether or not they had a disease, rather than by their exposure status.

(a)

		ABNORMAL FERTILITY?		
		Yes	No	Total
Exposure over 3 months?	Yes	10	1	11
	No	1	10	11
Total		11	11	22

Odds Ratio by “cross-products”

$$(10 \times 10)/(1 \times 1) = 100$$

Using the standard “cross-products” method of estimating the relative risk in a case-control study (described in Example 6), the relative risk of infertility in men employed for more than three months was found to be approximately 100 — a very high strength of association.

This example not only illustrates a very large relative risk in spite of small numbers but, again, as in Example 6, provides another good illustration of why the relative risk cannot be calculated by the same method as in the usual cohort study.

In a cohort study, the rate of disease per 100, per 1,000, etc., is calculated horizontally in the table by dividing the number of cases of disease in the exposed group by the total number of people in the exposed group. The same process is followed for the unexposed group, and the two rates are compared, giving a ratio that we call the relative risk.

The crucial point here is that the rate for the unexposed group is assumed to be the rate in the normal population. If, however, we are looking at just a *sample* of such people (in this case, those with less than three months' exposure in a particular department), the estimate of the normal rate may be quite inaccurate. In this sense, the figures for the unexposed group in a case-control study are like those in a public-opinion poll — they are based on a small sample of the general population.

Furthermore, the “cross-products” method of estimating the relative risk can be quite accurate *provided that* the prevalence of the disease is low in the general population. If it is high (say, more than 1 or 2%), serious inaccuracies can result.

This point is illustrated in the following two examples.

(b)

		ABNORMAL FERTILITY?			Rate per 100,000
		Yes	No	Total	
Exposure over 3 months?	Yes	10	1,000	1,010	990.1
	No	1	10,000	10,001	10.0
Total		11	11,000	11,011	

Relative Risk

$$990.1/10.0 = 99.01$$

(c)

		ABNORMAL FERTILITY?			Rate per 100,000
		Yes	No	Total	
Exposure over 3 months?	Yes	10	1	11	90.9
	No	1	10	11	9.1
Total		11	11	22	

Wrong!!

“Relative Risk” arithmetic is not appropriate

$$90.9/8.1 = 10$$

- In Table (b) is the calculation based on the ratio being *truly* 1 in 11 in the general population. The “No abnormal fertility” numbers are multiplied by 1,000, so that the analysis is now based on the “population” — say, the total 11,011 men in the town, most of whom have never worked at the plant, let alone the department. The *normal prevalence* of abnormal fertility is thus 11 in 11,011, or 0.10%. With such a low prevalence, the cross-products figure of 100 that we saw earlier should have been quite accurate. Indeed, the ratio of the two rates (over three months versus under three months) works out to just over 99.
- In contrast, the example in Table (c) shows the result of using the left-to-right method of calculating rates that we would use in cohort studies. In this small group of workers, the calculation leads to an apparent relative risk of only 10. Admittedly, this is high, but it is much lower than the true relative risk of about 100.

This example illustrates two points:

- First, if the toxic agent is very powerful, even small numbers will give a very impressive relative risk.
- Second, in a case-control study, the estimation of relative risk cannot be done by the usual method for cohort studies — namely, left-to-right calculation of totals, then rates, followed by the division of rates to give a ratio.



Format of Reports for Regulation Review

Date: January 14, 1993

A. Introduction

As per resolution of the R.A.C. meeting of December 15/16, 1992, Rex Eaton, Jim Halliday and John Weir met on January 5, 1993, to develop a format for reports from the Specialty Subcommittees, Working Groups and the Regulation Advisory Committee.

Consensus decisions made at the meeting addressed the format of reports, the meaning of the term consensus and the means of assembling binders representing the historical record of committees. (The group also reviewed a document from the Secretariat summarizing the format of draft regulations.)

B. Format of Reports

It was agreed that the format of the report include: Signatures of all members of the committee or group, Table of Contents, Introduction, Body of the Report, and Appendices.

1. Signatures

Reports should be signed off by all members of the committee as accurately reflecting the position the committee reached. Where a member does not wish to sign they would be expected to submit an explanation of their disagreement with the report.

2. Introduction

The Introduction should address

- Outline of the mandate of the committee, including the general rationale for the subject matter the committee was expected to address
- How the outcome of the committee's work fits with core and process regulations
- Make-up of committee

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- Resources used by the committee to reach conclusions (e.g. legislation from other jurisdictions, particular scientific and technical documents, consultants, etc.)
 - Broad outline of areas of consensus achieved
 - Broad outline of issues left outstanding
 - Broad outline of issues referred to other committees to solve and the identity of those committees.

3. **Body of Report**

The body of the report should be organized under topics with an explanation of what the committee was trying to achieve, what they achieved, where consensus was reached and what was intended by that consensus.

Where the committee had specific concerns these should be addressed fully as to what was intended and what was not intended.

The rationale for all regulatory recommendations should be explained. The statement of rationale would typically follow the regulatory proposal except where it would be beneficial to provide that information first.

Areas where consensus was not reached should be described and the positions of the parties spelled out. (Note: Any detailed minority reports or letters of concern would be attached to the report as Appendices.)

To facilitate an understanding of the recommendations within each topic area it was agreed that information should be assembled under the headings of

- (1) Consensus Recommendation
- (2) Majority Recommendation (where one or more individuals dissent)
- (3) Minority Position (of the one or more individuals who dissented).

It was agreed that a minority position, even if held by only one person, should appear in the report. The dissenter(s) should be prepared to provide a detailed explanation of his or her dissent, with the assistance of the Secretariat if requested.

Where the parties at the table, as parties, were unable to come to agreement this would be noted and the position of each of the parties would be recorded under the heading: Separate Recommendations.

All items for further work should be highlighted for easy reference.

It was agreed that the objective of each committee is to assemble recommendations for regulatory proposals rather than scripted regulations. In recognition that in some cases, wording may be of particular importance to the committee in terms of scripting regulations these should be highlighted using quotation marks.

C. The Meaning of the Term Consensus

The term “consensus” means the agreement of all persons in the committee.

Where a consensus is not achieved and a majority of members supports a recommendation, that should be reported as a “majority recommendation.” The minority perspective will be reported as a “minority position.”

It was recognized that in some cases a consensus position may be conditional on an agreement elsewhere in the process. This would be reported as a “conditional consensus.”

The term “operating consensus” would not appear in a final report. It is recognized to be a useful process term and would be used in process documents leading to a final report with the meaning that an interim consensus has been established subject to revisit dependent on the outcome of further discussions.

D. Historical Record of Committee Activity

It was agreed that historical records should be assembled for each committee covering

- (1) Table of Contents,
- (2) Introductory foreword from the chairman and coordinator explaining in general terms the review process and where the committee’s activities fit into the process (a flow chart could be included),
- (3) The text of the final report of the committee,
- (4) The minutes of all the meetings of the committee,

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- (5) Brief biographies of the members of the committee,
 - (6) Any truly important working documents that may have aided in achieving consensus,
 - (7) A bibliography of any materials that may be important to highlight,
 - (8) A copy of the draft regulations that went to public hearing, pertaining to that committee's work,
 - (9) The terms of reference of the committee,
 - (10) A copy of the final gazetted regulations, and
 - (11) Comments on the committee's report by other designated committees.

E. Drafts for Public Hearings

Rex provided a copy of the Secretariat guidance document on format of draft regulations to go to public hearings upon which there was consensus. A copy is attached as Appendix 1.

APPENDIX 1: FORMAT OF DRAFT REGULATIONS TO GO TO PUBLIC HEARINGS

1. General

Formatting shall incorporate the recommendations of the Working Group on Regulation Format. Regulations will be organized in Parts. Parts will be broken into Sections.

2. Numbering

All numbering to be sequential within Parts. Individual regulations to be numbered in the following general pattern:

Regulation 1.1(1)(a) where

1 is the Part

1.1 is the regulation with clause (1) and subclause (a)

3. Use of Explanatory Notes

- Each Part will be provided with a cover page which provides general explanation of the process and changes from existing regulations. Topics to cover are:
 - Notes on development/review by subcommittee/R.A.C./G.C.R.R.
 - Change in numbering system from old regulations
 - Major area(s) of substantive change
- Throughout the draft regulations explanatory notes will be added where necessary to provide an understanding of intent/rationale, and the location of new regulations in the current regulations book.
- It will be useful to add a list of cross references from old to new regulations at the end.

4. Page Layout

All Sections are to be provided with headings.

All Regulations are to be provided with call-out terms to the left of text of regulation.

5. Upper/Lower Case, Font Size, Italics, Boldface

Font Name:	C.G. Times
Title of Part:	Upper case, boldface, font size 15
Section Headings:	Upper/lower case, boldface, font size 15
Regulation Call-out:	Upper/lower case, boldface, font size 10
Italics:	Use italics only for Terms being defined, and Reference to statute, other regulations, codes.

6. Punctuation

All regulations which read as a sentence with a series of numbered or lettered clauses shall be punctuated with commas after each clause (except for the next to last clause which shall end in the format “, and”). No colon shall be used at the end of the introductory phrase.

7. Location of Tables/Diagrams

Wherever possible, these shall be located in the text.

Silviculture Subcommittee — Terms of Reference

Date: December 16, 1992

These terms of reference state the mission, structure, protocol and responsibilities of the Silviculture Subcommittee of the Governors' Committee for Regulation Review established by the governors of the Workers' Compensation Board of British Columbia.

Mission Statement

The mission of the Silviculture Subcommittee is to assist the governors with the development of regulations for accommodation, sanitary and safety conditions in and around silviculture camps.

The Subcommittee shall work within the context of, and be guided by the document entitled, *Review and Development of Occupational Safety and Health Regulations* adopted by the governors on January 7, 1992.

The Subcommittee shall observe the principles of the regulation review process in carrying out its mission; for example:

- It shall be respectful of the interests of workers, employers, the community and the W.C.B.
- Its proceedings shall be open and participative
- It shall respect consensus and involve the parties with the most direct interest in outcomes.

Structure

1. The Governors' Committee for Regulation Review shall appoint three persons representative of workers, three persons representative of employers, and two persons seconded through the Secretariat who will provide advice, guidance and administrative support. The Governors' Committee shall consult with worker and employer groups in the selection of worker

and employer representatives. In addition, the Governors' Committee shall ask for a representative from each of the Ministry of Health and of Forests to participate as advisors.

2. The Subcommittee shall be chaired by one of the persons appointed through the Secretariat. In that person's absence the second Secretariat appointee shall serve as chair.
3. The Subcommittee shall report to the Governors' Committee for Regulation Review which, in consultation with the Regulation Advisory Committee, shall review any reports and recommendations issued by the Subcommittee.
4. The Subcommittee may request the presence at meetings of professional and expert persons considered necessary by the Subcommittee.
5. The Secretariat for Regulation Review shall provide administrative and advisory services to the Subcommittee. The chair of the Subcommittee shall consult with the coordinator of Regulation Review on matters which involve the expenditure of monies in Subcommittee activity; for example, arrangement of meetings at hotels, Subcommittee travel and persons whose presence is requested at meetings where that presence involves expenditure of monies.

Protocol

1. Where practicable, the agenda and any supporting materials shall be delivered to each member of the Subcommittee by the Secretariat for Regulation Review, not later than seven days prior to the date of the meeting.
2. The preferred method of decision making shall be through consensus.
3. Summaries shall be kept of each meeting of the Subcommittee and, after being signed and initialled by the chair of the Subcommittee for the meeting, shall be forwarded to the Secretariat for Regulation Review for retention.
4. The chairman of the governors and his designate are the official spokespersons for the Subcommittee.
5. Members shall support any consensus or decision reached by the Subcommittee in which they have joined. Minority reports shall be included in any report of the Subcommittee at the request of any person(s) holding a minority opinion.

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6. Persons seconded to the Secretariat for the purpose of participation on the subcommittee shall work within the terms of the document “Guidelines for Persons Seconded to the Secretariat.”
 7. The Subcommittee shall work within a time frame of January 31, 1993, to April 30, 1993, for proposals for regulations.

Responsibilities

1. The Subcommittee shall develop proposals for submission to the Governors’ Committee for Regulation Review.
2. The Subcommittee shall be guided by the perspective that effective regulations are those which:
 - Are achieved through participation and consensus
 - Clearly address workplace hazards
 - Define responsibilities and accountability
 - Clearly state the criteria for compliance
 - Are in plain language, technically competent and easily understood
 - Provide a mechanism for ongoing review and update in areas subject to changing knowledge and technology
 - Affect workplace activity and conditions only to the extent necessary to address hazards
 - Address the diverse character of workplaces, and
 - Are compatible with, and do not overlap related regulations.
3. The Subcommittee shall, in its deliberations, be cognizant of the documents:
 - Proposed Silviculture Camp Regulation (developed 1991 — W.C.B.)
 - Schedule D — Camp Standards — Silviculture Contract (Ministry of Forests form FS776 HSI90/9)
 - Industrial Health and Safety Regulations
 - Occupational Environment Regulations
 - Public Forum on Health and Safety Regulation Review
 - Policy and Procedure Manual of the O.S.H. Division
 - Coroners’ recommendations relative to the Subcommittee’s work
4. The Subcommittee shall ensure the following issues are addressed and reported on:
 - Notification of Project for silviculture work
 - Accommodation, sanitary conditions and facilities for silviculture camps

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- Miscellaneous safety conditions in and around camps related; for example, to worker-check, work around snags (Any Subcommittee recommendations on work around snags shall be referred to the G.C.R.R./R.A.C. for possible referral to a Subcommittee contemplated on Forestry Operations).

- NOTE:**
- a) The Subcommittee will be guided by the perspective that the regulatory proposals on silviculture camps should be fashioned in a manner to be generalizable to all short-term camps, whether they be in silviculture or other sectors.
 - b) The issue of regulations related to protection from wildlife will be addressed by the Regulation Advisory Committee. The measures for the protection of workers from pesticides will be addressed by the Occupational Hygiene Subcommittee; those related to musculoskeletal injuries, by the Ergonomics Subcommittee.

5. Notwithstanding clause 4, the Subcommittee may offer recommendations of a general nature on regulatory matters related to the health and safety of workers in the silviculture sector.
6. The final report of the Subcommittee shall provide proposals for regulations in as specific a manner as practicable, covering matters identified in clauses 4 and 5. The drafting of actual regulations will be undertaken by the Secretariat at the direction of the Governors' Committee on Regulation Review. It is the intent of the process to reconvene the Subcommittee to provide the opportunity for review of draft regulations and for comment to the Governors' Committee on Regulation Review.
7. In carrying out its mission and its responsibilities, the Subcommittee shall, at all times, be subject to the *Workers Compensation Act* and the bylaws and resolutions of the governors of the Workers' Compensation Board.

Underwater Diving Subcommittee — Terms of Reference

Date: February 23, 1993

These terms of reference state the mission, structure, protocol and responsibilities of the Underwater Diving Subcommittee of the Governors' Committee for Regulation Review established by the governors of the Workers' Compensation Board of British Columbia.

Mission Statement

The mission of the Underwater Diving Subcommittee is to assist the governors with the development of regulations on underwater diving.

The Subcommittee shall work within the context of, and be guided by the document entitled, *Review and Development of Occupational Safety and Health Regulations* adopted by the governors on January 7, 1992.

The Subcommittee shall observe the principles of the regulation review process in carrying out its mission; for example:

- It shall be respectful of the interests of workers, employers, the community and the W.C.B.
- Its proceedings shall be open and participative
- It shall respect consensus and involve the parties with the most direct interest in outcomes.

Structure

1. The Governors' Committee for Regulation Review shall appoint three persons representative of workers, three persons representative of employers, and two persons seconded through the Secretariat who will provide advice, guidance and administrative support. The Governors' Committee shall consult with worker and employer groups in the selection of worker and employer representatives.

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2. The Subcommittee shall be chaired by one of the persons appointed through the Secretariat. In that person's absence the second Secretariat appointee shall serve as chair.
 3. The Subcommittee shall report to the Governors' Committee for Regulation Review which, in consultation with the Regulation Advisory Committee, shall review any reports and recommendations issued by the Subcommittee.
 4. The Subcommittee may request the presence at meetings of professional and expert persons considered necessary by the Subcommittee.
 5. The Secretariat for Regulation Review shall provide administrative and advisory services to the Subcommittee. The chair of the Subcommittee shall consult with the coordinator of Regulation Review on matters which involve the expenditure of monies in Subcommittee activity; for example, arrangement of meetings at hotels, Subcommittee travel and persons whose presence is requested at meetings where that presence involves expenditure of monies.

Protocol

1. Where practicable, the agenda and any supporting materials shall be delivered to each member of the Subcommittee by the Secretariat for Regulation Review, not later than seven days prior to the date of the meeting.
2. The preferred method of decision making shall be through consensus.
3. Summaries shall be kept of each meeting of the Subcommittee and, after being signed and initialled by the chair of the Subcommittee for the meeting, shall be forwarded to the Secretariat for Regulation Review for retention.
4. The chairman of the governors and his designate are the official spokespersons for the Subcommittee.
5. Members shall support any consensus or decision reached by the Subcommittee in which they have joined. Minority reports shall be included in any report of the Subcommittee at the request of any person(s) holding a minority opinion.
6. Persons seconded to the Secretariat for the purpose of participation on the subcommittee shall work within the terms of the document "Guidelines for Persons Seconded to the Secretariat."

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7. The Subcommittee shall work within a time frame of May 1, 1993, to July 31, 1993.

Responsibilities

1. The Subcommittee shall develop proposals for submission to the Governors' Committee for Regulation Review on underwater diving regulations.
2. The Subcommittee shall be guided by the perspective that effective regulations are those which:
 - Are achieved through participation and consensus
 - Clearly address workplace hazards
 - Define responsibilities and accountability
 - Clearly state the criteria for compliance
 - Are in plain language, technically competent and easily understood
 - Provide a mechanism for ongoing review and update in areas subject to changing knowledge and technology
 - Affect workplace activity and conditions only to the extent necessary to address hazards
 - Address the diverse character of workplaces, and
 - Are compatible with, and do not overlap related regulations.
3. The Subcommittee shall, in its deliberations, be cognizant of the documents:
 - Industrial Health and Safety Regulations
 - Public Forum on Health and Safety Regulation Review
 - O.S.H. Administrative Inventory
 - Policy and Procedure Manual of the O.S.H. Division
 - Relevant reports from other Subcommittees (e.g. Fishing Safety Subcommittee and Equipment Safety Subcommittee)
 - Coroners' recommendations relative to the Subcommittee's work
 - Safety and design standards and codes currently in use.
4. The Subcommittee shall ensure the following matter is addressed and reported on:
 - Regulations on underwater diving (Section 11 of I.H. and S. Regulations) applicable to commercial diving, research diving, diving at fish farms and seafood harvesting.

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5. Notwithstanding clause 4, the Subcommittee may offer recommendations of a general nature on regulatory matters related to underwater diving.
 6. The final report of the Subcommittee shall provide proposals for regulations in as specific a manner as practicable, covering matters identified in clauses 4 and 5, and in a format established by the Regulation Advisory Committee. The drafting of actual regulations will be undertaken by the Secretariat at the direction of the Governors' Committee on Regulation Review. It is the intent of the process to reconvene the Subcommittee to provide the opportunity for review of draft regulations and for comment to the Governors' Committee on Regulation Review.
 7. In carrying out its mission and performing its responsibilities, the Subcommittee shall, at all times, be subject to the *Workers Compensation Act* and the bylaws and resolutions of the governors of the Workers' Compensation Board.

REPORTER

Land Transportation and Traffic Control Subcommittee — Terms of Reference

Date: February 23, 1993

These terms of reference state the mission, structure, protocol and responsibilities of the Land Transportation and Traffic Control Subcommittee of the Governors' Committee for Regulation Review established by the governors of the Workers' Compensation Board of British Columbia.

Mission Statement

The mission of the Land Transportation and Traffic Control Subcommittee is to assist the governors with the development of regulations for the safety of workers being transported on land, those involved with traffic control and workers working on or in proximity to travelled roads.

The Subcommittee shall work within the context of, and be guided by the document entitled, *Review and Development of Occupational Safety and Health Regulations* adopted by the governors on January 7, 1992.

The Subcommittee shall observe the principles of the regulation review process in carrying out its mission; for example:

- It shall be respectful of the interests of workers, employers, the community and the W.C.B.
- Its proceedings shall be open and participative
- It shall respect consensus and involve the parties with the most direct interest in outcomes.

Structure

1. The Governors' Committee for Regulation Review shall appoint three persons representative of workers, three persons representative of employers, and two persons seconded through the Secretariat who will provide

advice, guidance and administrative support. The Governors' Committee shall consult with worker and employer groups in the selection of worker and employer representatives. In addition, the Governors' Committee shall ask for a representative from each of the Ministry of Transportation and Highways, the Motor Vehicles Branch of the Ministry of the Attorney General and the Employment Standards Branch of the Ministry of Labour and Consumer Services, to participate as advisors.

2. The Subcommittee shall be chaired by one of the persons appointed through the Secretariat. In that person's absence the second Secretariat appointee shall serve as chair.
3. The Subcommittee shall report to the Governors' Committee for Regulation Review which, in consultation with the Regulation Advisory Committee, shall review any reports and recommendations issued by the Subcommittee.
4. The Subcommittee may request the presence at meetings of professional and expert persons considered necessary by the Subcommittee.
5. The Secretariat for Regulation Review shall provide administrative and advisory services to the Subcommittee. The chair of the Subcommittee shall consult with the coordinator of Regulation Review on matters which involve the expenditure of monies in Subcommittee activity; for example, arrangement of meetings at hotels, Subcommittee travel and persons whose presence is requested at meetings where that presence involves expenditure of monies.

Protocol

1. Where practicable, the agenda and any supporting materials shall be delivered to each member of the Subcommittee by the Secretariat for Regulation Review, not later than seven days prior to the date of the meeting.
2. The preferred method of decision making shall be through consensus.
3. Summaries shall be kept of each meeting of the Subcommittee and, after being signed and initialled by the chair of the Subcommittee for the meeting, shall be forwarded to the Secretariat for Regulation Review for retention.
4. The chairman of the governors and his designate are the official spokespersons for the Subcommittee.

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5. Members shall support any consensus or decision reached by the Subcommittee in which they have joined. Minority reports shall be included in any report of the Subcommittee at the request of any person(s) holding a minority opinion.
 6. Persons seconded to the Secretariat for the purpose of participation on the subcommittee shall work within the terms of the document "Guidelines for Persons Seconded to the Secretariat."
 7. The Subcommittee shall work within a time frame of June 1, 1993, to August 31, 1993.

Responsibilities

1. The Subcommittee shall develop proposals for submission to the Governors' Committee for Regulation Review on land transportation and traffic control regulations.
2. The Subcommittee shall be guided by the perspective that effective regulations are those which:
 - Are achieved through participation and consensus,
 - Clearly address workplace hazards,
 - Define responsibilities and accountability,
 - Clearly state the criteria for compliance,
 - Are in plain language, technically competent and easily understood,
 - Provide a mechanism for ongoing review and update in areas subject to changing knowledge and technology,
 - Affect workplace activity and conditions only to the extent necessary to address hazards,
 - Address the diverse character of workplaces, and
 - Are compatible with, and do not overlap related regulations.
3. The Subcommittee shall, in its deliberations, be cognizant of the documents:
 - Industrial Health and Safety Regulations,
 - Public Forum on Health and Safety Regulation Review,
 - O.S.H. Administrative Inventory,
 - Policy and Procedure Manual of the O.S.H. Division,
 - Relevant Reports from other Subcommittees; for example, First Aid and Agriculture,
 - Coroners' recommendations relative to the Subcommittee's work,
 - Safety and design standards and codes currently in use.

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4. The Subcommittee shall ensure the following matters are addressed and reported on:
 - Transportation of Workers regulations, Regulations 28.02–28.12 in the current I.H. and S. Regulations,
 - Traffic Control regulations in Section 52 of the current I.H. and S. Regulations.

Note: The Subcommittee will be expected to review the regulatory proposals from the Agriculture Subcommittee for the transportation of workers, and proposals from the Equipment Safety Subcommittee concerning the use of small ridership vehicles such as A.T.V.'s.

 - Application of Section 6 of the I.H. and S. Regulations on motor vehicle accident reporting.
 5. Notwithstanding clause 4, the Subcommittee may offer recommendations of a general nature on regulatory matters related to land transportation and traffic control of workers.
 6. The final report of the Subcommittee shall provide proposals for regulations in as specific a manner as practicable, covering matters identified in clauses 4 and 5, and in a format established by the Regulation Advisory Committee. The drafting of actual regulations will be undertaken by the Secretariat at the direction of the Governors' Committee on Regulation Review. It is the intent of the process to reconvene the Subcommittee to provide the opportunity for review of draft regulations and for comment to the Governors' Committee on Regulation Review.
 7. In carrying out its mission and performing its responsibilities, the Subcommittee shall, at all times, be subject to the *Workers Compensation Act* and the bylaws and resolutions of the governors of the Workers' Compensation Board.

Electrical Safety Subcommittee — Terms of Reference

Date: February 23, 1993

These terms of reference state the mission, structure, protocol and responsibilities of the Electrical Safety Subcommittee of the Governors' Committee for Regulation Review established by the governors of the Workers' Compensation Board of British Columbia.

Mission Statement

The mission of the Electrical Safety Subcommittee is to assist the governors with the development of regulations for work on or near electrical systems.

The Subcommittee shall work within the context of, and be guided by the document entitled, *Review and Development of Occupational Safety and Health Regulations* adopted by the governors on January 7, 1992.

The Subcommittee shall observe the principles of the regulation review process in carrying out its mission; for example:

- It shall be respectful of the interests of workers, employers, the community and the W.C.B.
- Its proceedings shall be open and participative
- It shall respect consensus and involve the parties with the most direct interest in outcomes.

The Subcommittee shall maintain liaison with the Electrical Safety Advisory Committee of B.C.

Structure

1. The Governors' Committee for Regulation Review shall appoint three persons representative of workers, three persons representative of employers, and two persons seconded through the Secretariat who will provide advice, guidance and administrative support. The Governors' Committee

shall consult with worker and employer groups in the selection of worker and employer representatives. In addition, the Governors' Committee shall ask for a representative from the Electrical Safety Branch of the Safety Engineering Services Division of the Ministry of Municipal Affairs, Recreation and Culture to participate as an adviser.

2. The Subcommittee shall be chaired by one of the persons appointed through the Secretariat. In that person's absence the second Secretariat appointee shall serve as chair.
3. The Subcommittee shall report to the Governors' Committee for Regulation Review which, in consultation with the Regulation Advisory Committee, shall review any reports and recommendations issued by the Subcommittee.
4. The Subcommittee may request the presence at meetings of professional and expert persons considered necessary by the Subcommittee.
5. The Secretariat for Regulation Review shall provide administrative and advisory services to the Subcommittee. The chair of the Subcommittee shall consult with the coordinator of Regulation Review on matters which involve the expenditure of monies in Subcommittee activity; for example, arrangement of meetings at hotels, Subcommittee travel and persons whose presence is requested at meetings where that presence involves expenditure of monies.

Protocol

1. Where practicable, the agenda and any supporting materials shall be delivered to each member of the Subcommittee by the Secretariat for Regulation Review, not later than seven days prior to the date of the meeting.
2. The preferred method of decision making shall be through consensus.
3. Summaries shall be kept of each meeting of the Subcommittee and, after being signed and initialled by the chair of the Subcommittee for the meeting, shall be forwarded to the Secretariat for Regulation Review for retention.
4. The chairman of the governors and his designate are the official spokespersons for the Subcommittee.

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5. Members shall support any consensus or decision reached by the Subcommittee in which they have joined. Minority reports shall be included in any report of the Subcommittee at the request of any person(s) holding a minority opinion.
 6. Persons seconded to the Secretariat for the purpose of participation on the subcommittee shall work within the terms of the document "Guidelines for Persons Seconded to the Secretariat."
 7. The Subcommittee shall work within a time frame of March 1, 1993, to June 30, 1993.

Responsibilities

1. The Subcommittee shall develop proposals for submission to the Governors' Committee for Regulation Review on electrical safety regulations.
2. The Subcommittee shall be guided by the perspective that effective regulations are those which:
 - Are achieved through participation and consensus
 - Clearly address workplace hazards
 - Define responsibilities and accountability
 - Clearly state the criteria for compliance
 - Are in plain language, technically competent and easily understood
 - Provide a mechanism for ongoing review and update in areas subject to changing knowledge or technology
 - Affect workplace activity and conditions only to the extent necessary to address hazards,
 - Address the diverse character of workplaces, and
 - Are compatible with, and do not overlap related regulations.
3. The Subcommittee shall, in its deliberations, be cognizant of the documents:
 - Industrial Health and Safety Regulations,
 - Public Forum on Health and Safety Regulation Review,
 - O.S.H. Administrative Inventory,
 - Policy and Procedure Manual of the O.S.H. Division,
 - Relevant reports from other Subcommittees,
 - Coroners' recommendations relative to the Subcommittee's work,
 - Safety and design standards and codes currently in use, including those established by B.C. Hydro,
 - Canadian Electrical Code with B.C. amendments, bulletins and directives.

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4. The Subcommittee shall ensure the following matters are addressed and reported on:
 - Current regulations in Section 22, Electrical Systems,
 - Current regulations in Section 24, Proximity to Overhead Powerlines, and tree trimming near energized conductors,
 - Regulations on electrical safety where they appear in other Sections,
 - The question of the certification of tree trimmers (as per Public Forum input).

Note:

 - The Subcommittee’s attention is drawn to the work of the Equipment Safety Subcommittee on lock-out. The two Subcommittees will be expected to liaise on the relationship of general lock-out procedures to those for electrical systems.
 - The Occupational Hygiene Subcommittee will deal with the question of any health hazards associated with extra-low frequency radiation (E.L.F.).
 - The R.A.C. has a mandate to review and advise on the question of the certification of workers.
 5. Notwithstanding clause 4, the Subcommittee may offer recommendations of a general nature on regulatory matters related to electrical safety.
 6. The final report of the Subcommittee shall provide proposals for regulations in as specific a manner as practicable, covering matters identified in clauses 4 and 5, and in a format established by the Regulation Advisory Committee. The drafting of actual regulations will be undertaken by the Secretariat at the direction of the Governors’ Committee on Regulation Review. It is the intent of the process to reconvene the Subcommittee to provide the opportunity for review of draft regulations and for comment to the Governors’ Committee on Regulation Review.
 7. In carrying out its mission and performing its responsibilities, the Subcommittee shall, at all times, be subject to the *Workers Compensation Act* and the bylaws and resolutions of the governors of the Workers’ Compensation Board.

REPORTER

Blasting and Underground Workings Subcommittee — Terms of Reference

Date: February 23, 1993

These terms of reference state the mission, structure, protocol and responsibilities of the Blasting and Underground Workings Subcommittee of the Governors' Committee for Regulation Review established by the governors of the Workers' Compensation Board of British Columbia.

Mission Statement

The mission of the Blasting and Underground Workings Subcommittee is to assist the governors with the development of regulations for the protection of workers involved with blasting procedures and in underground workings.

The Subcommittee shall work within the context of, and be guided by the document entitled, *Review and Development of Occupational Safety and Health Regulations* adopted by the governors on January 7, 1992.

The Subcommittee shall observe the principles of the regulation review process in carrying out its mission; for example:

- It shall be respectful of the interests of workers, employers, the community and the W.C.B.
- Its proceedings shall be open and participative
- It shall respect consensus and involve the parties with the most direct interest in outcomes.

Structure

1. The Governors' Committee for Regulation Review shall appoint three persons representative of workers, three persons representative of employers, and two persons seconded through the Secretariat who will provide

advice, guidance and administrative support. The Governors' Committee shall consult with worker and employer groups in the selection of worker and employer representatives. In addition, the Governors' Committee shall ask for a representative from the Resource Management Branch, Ministry of Energy, Mines and Petroleum Resources.

2. The Subcommittee shall be chaired by one of the persons appointed through the Secretariat. In that person's absence the second Secretariat appointee shall serve as chair.
3. The Subcommittee shall report to the Governors' Committee for Regulation Review which, in consultation with the Regulation Advisory Committee, shall review any reports and recommendations issued by the Subcommittee.
4. The Subcommittee may request the presence at meetings of professional and expert persons considered necessary by the Subcommittee.
5. The Secretariat for Regulation Review shall provide administrative and advisory services to the Subcommittee. The chair of the Subcommittee shall consult with the coordinator of Regulation Review on matters which involve the expenditure of monies in Subcommittee activity; for example, arrangement of meetings at hotels, Subcommittee travel and persons whose presence is requested at meetings where that presence involves expenditure of monies.

Protocol

1. Where practicable, the agenda and any supporting materials shall be delivered to each member of the Subcommittee by the Secretariat for Regulation Review, not later than seven days prior to the date of the meeting.
2. The preferred method of decision making shall be through consensus.
3. Summaries shall be kept of each meeting of the Subcommittee and, after being signed and initialled by the chair of the Subcommittee for the meeting, shall be forwarded to the Secretariat for Regulation Review for retention.
4. The chairman of the governors and his designate are the official spokespersons for the Subcommittee.

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5. Members shall support any consensus or decision reached by the Subcommittee in which they have joined. Minority reports shall be included in any report of the Subcommittee at the request of any person(s) holding a minority opinion.
 6. Persons seconded to the Secretariat for the purpose of participation on the subcommittee shall work within the terms of the document "Guidelines for Persons Seconded to the Secretariat."
 7. The Subcommittee shall work within a time frame of June 1, 1993, to September 30, 1993.

Responsibilities

1. The Subcommittee shall develop proposals for submission to the Governors' Committee for Regulation Review on blasting and underground workings regulations.
2. The Subcommittee shall be guided by the perspective that effective regulations are those which:
 - Are achieved through participation and consensus
 - Clearly address workplace hazards
 - Define responsibilities and accountability
 - Clearly state the criteria for compliance
 - Are in plain language, technically competent and easily understood
 - Provide a mechanism for ongoing review and update in areas subject to changing knowledge and technology
 - Affect workplace activity and conditions only to the extent necessary to address hazards
 - Address the diverse character of workplaces, and
 - Are compatible with, and do not overlap related regulations.
3. The Subcommittee shall, in its deliberations, be cognizant of the documents:
 - Industrial Health and Safety Regulations
 - Public Forum on Health and Safety Regulation Review
 - O.S.H. Administrative Inventory
 - Policy and Procedure Manual of the O.S.H. Division
 - Relevant reports from other Subcommittees (e.g. Occupational Hygiene)
 - Coroners' recommendations relative to the Subcommittee's work
 - Safety and design standards and codes currently in use

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- Health, Safety and Reclamation Code for Mines in B.C.
 - W.C.B. Requirements for Underground Workings, June, 1982.
4. The Subcommittee shall ensure the following matters are addressed and reported on:
 - Explosives regulations in Section 46 of the current I.H and S. Regulations,
 - Underground Workings regulations in Section 40 of the current I.H. and S. Regulations,
 - Issues identified in Public Forums, including blasting procedures for avalanche control, safety fuses, differences between W.C.B. Regulations and those of Ministry of Mines,
 - Update of all references to other legislation.

Note: This Subcommittee shall liaise with the Occupational Hygiene Subcommittee on the topic of ventilation of underground workings.

5. Notwithstanding clause 4, the Subcommittee may offer recommendations of a general nature on regulatory matters related to blasting and underground workings.
6. The final report of the Subcommittee shall provide proposals for regulations in as specific a manner as practicable, covering matters identified in clauses 4 and 5, and in a format established by the Regulation Advisory Committee. The drafting of actual regulations will be undertaken by the Secretariat at the direction of the Governors' Committee on Regulation Review. It is the intent of the process to reconvene the Subcommittee to provide the opportunity for review of draft regulations and for comment to the Governors' Committee on Regulation Review.
7. In carrying out its mission and performing its responsibilities, the Subcommittee shall, at all times, be subject to the *Workers Compensation Act* and the bylaws and resolutions of the governors of the Workers' Compensation Board.

Construction Safety Subcommittee — Terms of Reference

Date: February 23, 1993

These terms of reference state the mission, structure, protocol and responsibilities of the Construction Safety Subcommittee of the Governors' Committee for Regulation Review established by the governors of the Workers' Compensation Board of British Columbia.

Mission Statement

The mission of the Construction Safety Subcommittee is to assist the governors with the development of regulations for the safety of workers in and around activities of construction, excavation and demolition.

The Subcommittee shall work within the context of, and be guided by the document entitled, *Review and Development of Occupational Safety and Health Regulations* adopted by the governors on January 7, 1992.

The Subcommittee shall observe the principles of the regulation review process in carrying out its mission; for example:

- It shall be respectful of the interests of workers, employers, the community and the W.C.B.
- Its proceedings shall be open and participative
- It shall respect consensus and involve the parties with the most direct interest in outcomes.

Structure

1. The Governors' Committee for Regulation Review shall appoint three persons representative of workers, three persons representative of employers, and two persons seconded through the Secretariat who will provide advice, guidance and administrative support. The Governors' Committee

shall consult with worker and employer groups in the selection of worker and employer representatives.

2. The Subcommittee shall be chaired by one of the persons appointed through the Secretariat. In that person's absence the second Secretariat appointee shall serve as chair.
3. The Subcommittee shall report to the Governors' Committee for Regulation Review which, in consultation with the Regulation Advisory Committee, shall review any reports and recommendations issued by the Subcommittee.
4. The Subcommittee may request the presence at meetings of professional and expert persons considered necessary by the Subcommittee.
5. The Secretariat for Regulation Review shall provide administrative and advisory services to the Subcommittee. The chair of the Subcommittee shall consult with the coordinator of Regulation Review on matters which involve the expenditure of monies in Subcommittee activity; for example, arrangement of meetings at hotels, Subcommittee travel and persons whose presence is requested at meetings where that presence involves expenditure of monies.

Protocol

1. Where practicable, the agenda and any supporting materials shall be delivered to each member of the Subcommittee by the Secretariat for Regulation Review, not later than seven days prior to the date of the meeting.
2. The preferred method of decision making shall be through consensus.
3. Summaries shall be kept of each meeting of the Subcommittee and, after being signed and initialled by the chair of the Subcommittee for the meeting, shall be forwarded to the Secretariat for Regulation Review for retention.
4. The chairman of the governors and his designate are the official spokespersons for the Subcommittee.
5. Members shall support any consensus or decision reached by the Subcommittee in which they have joined. Minority reports shall be included in any report of the Subcommittee at the request of any person(s) holding a minority opinion.

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6. Persons seconded to the Secretariat for the purpose of participation on the subcommittee shall work within the terms of the document "Guidelines for Persons Seconded to the Secretariat."
 7. The Subcommittee shall work within a time frame of June 1, 1993, to September 30, 1993.

Responsibilities

1. The Subcommittee shall develop proposals for submission to the Governors' Committee for Regulation Review on construction safety regulations.
2. The Subcommittee shall be guided by the perspective that effective regulations are those which:
 - Are achieved through participation and consensus,
 - Clearly address workplace hazards,
 - Define responsibilities and accountability,
 - Clearly state the criteria for compliance,
 - Are in plain language, technically competent and easily understood,
 - Provide a mechanism for ongoing review and update in areas subject to changing knowledge and technology,
 - Affect workplace activity and conditions only to the extent necessary to address hazards,
 - Address the diverse character of workplaces, and
 - Are compatible with, and do not overlap related regulations.
3. The Subcommittee shall, in its deliberations, be cognizant of the documents:
 - Industrial Health and Safety Regulations,
 - Public Forum on Health and Safety Regulation Review,
 - O.S.H. Administrative Inventory
 - Policy and Procedure Manual of the O.S.H. Division,
 - Relevant reports from other Subcommittees (e.g. Equipment Safety and Ergonomics),
 - Coroners' recommendations relative to the Subcommittee's work,
 - Safety and design standards and codes currently in use, including applicable Standard Practices Manuals of W.C.B.

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4. The Subcommittee shall ensure the following matters are addressed and reported on:
 - Construction Procedures regulations in Section 34 of the current I.H. and S. Regulations,
 - Excavations regulations in Section 38 of the current I.H. and S. Regulations,
 - Demolition regulations in Section 39 of the current I.H. and S. Regulations,
 - Work in Compressed Air regulations in Section 44 of the current I.H. and S. Regulations.
 5. Notwithstanding clause 4, the Subcommittee may offer recommendations of a general nature on regulatory matters related to construction safety.
 6. The final report of the Subcommittee shall provide proposals for regulations in as specific a manner as practicable, covering matters identified in clauses 4 and 5, and in a format established by the Regulation Advisory Committee. The drafting of actual regulations will be undertaken by the Secretariat at the direction of the Governors' Committee on Regulation Review. It is the intent of the process to reconvene the Subcommittee to provide the opportunity for review of draft regulations and for comment to the Governors' Committee on Regulation Review.
 7. In carrying out its mission and performing its responsibilities, the Subcommittee shall, at all times, be subject to the *Workers Compensation Act* and the bylaws and resolutions of the governors of the Workers' Compensation Board.

REPORTER

Finding of the Medical Review Panel

Date: April 7, 1993
Panel: Stanley L. Sunshine, Panel Chairman
T. Bezeredi, Panel Member
H.L. Parfitt, Panel Member
Subject: A Claim for Suicide

Certificate of the Medical Review Panel

This certificate is the decision of the Panel or a Panel majority. We, the undersigned, on April 2, 1993, having duly considered all pertinent medical aspects on the worker's compensation claim, do hereby certify to the Board:

1. The cause of death was:
 - (i) massive cerebral trauma due to
 - (ii) multiple skull fractures due to
 - (iii) an approximate 60-foot free fall.
2. The etiology of the cause of death was suicide.
3. The worker's employment had causative significance in the suicide.

The worker had an obsessive personality structure. This rendered him vulnerable to a maladaptive response to stress. The Panel is aware of multiple stress factors including those evident in the lengthy telephone conversation with his wife immediately preceding his death. Nevertheless, it is the opinion of the Panel that the major stress factor in his life arose from work.

The combination of the vulnerable personality and the atypical work environment of gross understaffing with undiminished demands for performance led to a crisis in which the worker apparently concluded that he had no alternative other than suicide.

The Panel feels that the two contributing factors to the suicide were the personality and stress. It is the belief of the Panel that these contributing factors are equally responsible. With respect to stress, the preponderate influence is related to his work.

4. The cause of death was not wholly independent of his employment. Please see above.

Editors' note: This finding has been edited for publication. This finding by the Medical Review Panel overturns Decision No. 91-0818 rendered by the appeal commissioners and published in Workers' Compensation Reporter, Vol. 7(4): p. 223.

REPORTER

Memorandum of Appointment

Date: June 28, 1993
By: The B.C. Federation of Agriculture
The Canadian Farmworkers Union
The Workers' Compensation Board of British Columbia (W.C.B.)

Whereas on April 5, 1993, the governors of the Workers' Compensation Board of British Columbia approved the creation of the Farm and Ranch Safety and Health Agency (F.A.R.S.H.A.) to perform certain functions in relation to occupational safety and health in the agricultural industry;

AND WHEREAS F.A.R.S.H.A. is to be governed by a Board of Directors comprised of three employer representatives, three employee representatives and a neutral chair;

AND WHEREAS the neutral chair is to be chosen jointly by the B.C. Federation of Agriculture, the Canadian Farmworkers Union and the W.C.B.:

NOW THEREFORE the B.C. Federation of Agriculture, the Canadian Farmworkers Union and the W.C.B. appoint Mark Thompson as chair of the Board of Directors of F.A.R.S.H.A.



REPORTER

Notice of Delegation by the President

Date: February 22, 1993
Re: Medical Negligence or Malpractice

Section 84(4) of the *Workers Compensation Act* provides:

The president may delegate in writing any of his powers and duties to an officer of the board or other person subject to any terms and conditions set out in the delegation.

Pursuant to Section 84(4), I now delegate to the vice-president, Legal Services, or his nominee, the authority under policy #74.11 of the *Rehabilitation Services and Claims Policy Manual* to determine whether to proceed with a legal action as a result of alleged medical malpractice or negligence.

This delegation is effective immediately and is valid until further written notice.



REPORTER

Consumer Price Index Adjustment of Clothing Allowances

Date: June 7, 1993

Section 25 of the *Workers Compensation Act* provides for most of the dollar figures in the *Act* to be adjusted by the Board every six months according to changes in the Consumer Price Index.

Apart from the figures in the *Act*, the policies of the governors contain various dollar allowances or amounts. The former practice was that these amounts would be adjusted on an "ad hoc" basis. The last "ad hoc" adjustment occurred on March 1, 1991.

On August 10, 1992, the governors decided to increase these amounts as of January 1, 1993 (July 1, 1993, for clothing allowances). In some cases, a new fixed amount was specified; with regard to clothing allowances and other amounts, the Consumer Price Index ratios that have been determined under Section 25 since March 1, 1991, were to be applied.

As a result of the governors' decision, the clothing allowance rates set out below will be effective as of July 1, 1993.

	Old Rate	New Rate
Single Upper Limb Amputee	207.00	221.86
Bilateral Upper Limb Amputee	415.00	444.78
Lower Limb Amputee or Requires a Leg Brace	415.00	444.78
Upper and Lower Limb Amputee	622.00	666.65

The governors' decision provides that the above amounts will in future be adjusted on July 1 of each year by the Consumer Price Index ratios determined for that July 1 and the previous January 1. The first such adjustment will be on July 1, 1994.



Retroactive Adjudication Project Final Report**Date: August 1993****Executive Summary**

The Compensation Services Division submitted an estimate of the projected costs to the Board in support of their recommendation for retroactivity as a result of the Appeal Division Decision No. 91-0850 [as published in *Workers' Compensation Reporter*, Vol. 7(4): p. 173]. It was estimated that the project would review 18,300 overpayment files with the total amount being \$11.0 million and that \$3.1 million would be refunded (\$1.6 million in decisional errors and \$1.4 million in interest). A further \$1.1 million in unpaid decisional errors still owing to the Board would be cancelled by the project. These estimates relate to decisions to 1991 only. The project also included a review of 1992 overpayments.

The following are the statistical results of the project:

Decisions Reviewed:	Number	%	Amount
Administrative errors	21,901	84%	\$ 8,954,000
Decisional errors	4,103	16%	2,763,000
Total:	<u>26,004</u>	<u>100%</u>	<u>\$11,717,000</u>
Decisional errors refunded			\$ 1,281,000
Interest paid			1,015,000
Decisional \$ unpaid (workers not located)			161,000
Subtotal:			<u>\$ 2,457,000</u>
Decisional \$ cancelled*			\$ 1,321,000
Total:			<u>\$ 3,778,000</u>
Administrative Costs of the Project:			Amount
Salaries of project staff			\$ 516,000
Other administrative costs (office space, equipment, furniture rentals, postage, etc.)			71,400
Total:			<u>\$ 587,400</u>

* These represent decisional errors where overpayments were declared but the amounts were still outstanding. These overpayments have now been cancelled by the project.

Background

Fairness Issue

The fairness issues surrounding the Board's practice of declaring and collecting overpayments have existed for many years.

A Board of Review found in 1979 that the Workers' Compensation Board was not entitled to collect an overpayment where the injured worker had been totally honest in providing all the facts. It found that ". . . it would be contrary to fairness to allow retroactive application of a reconsidered decision where the claimant had acted in good faith throughout. . . . The financial consequences of repaying past benefits could cause a great deal of hardship for such claimants through no fault of their own."

In September 1981 the ombudsman sent to the Board his findings with respect to the general issue of the recovery of overpayments. The document, sent to the Board pursuant to the *Ombudsman Act*, included a memorandum of legal analysis that concluded, among other things, "There is no statutory authority in the *Workers Compensation Act* to enable the Board to recover overpayments." It went on to find that "aside from the legal arguments I have presented, there is strong argument to be made that non-culpable overpayments should not be recovered on grounds of fairness or equity."

The Board's Legal Services Division critiqued the report from the ombudsman and concluded that the legal conclusions of the ombudsman "are largely incorrect." It concluded that "the Board possesses an implied right under legislation to recover (at the very least by set off) compensation benefits paid in error." The report did not comment on the equity.

Various Review Boards in 1987 and 1988 determined the following:

- "In the absence of fraud, misrepresentation, concealment of evidence, or the like, the new decision cannot have retroactive effect to the extent that it creates a debt (called an overpayment) which did not exist prior to the re-adjudication."
- "That the Board has no authority to retrospectively overturn a prior decision."
- "That the Board requires express statutory authority to retroactively re-adjudicate."

Appeal Division Decision

When assuming responsibility on June 3, 1991, the Appeal Division had before it five Review Board findings all involving the Board's legal authority to declare and recover overpayments from workers. The Appeal Division's Decision No. 91-0850 on November 22, 1991 dealt with the issue of retroactive adjudication in the context of these five appeals.

The Appeal Division decision concluded that the following principles apply:

- The Board has the authority to declare and collect overpayments arising through administrative error.
- Generally, the Board does not have the authority to retroactively adjudicate a claim and thereby create a debt owed by a worker to the Board.
- The Board does have the authority to retroactively adjudicate and create a debt owed to the Board in situations of fraud or misrepresentation by the worker or where the decision under review was not one within the statutory authority of the Board.
- The Board must pay any additional benefits to a worker that are a result of retroactive adjudication.

Board of Governor Resolutions

Prospective amendments to the *Rehabilitation Services and Claims Manual* were approved by the governors on March 2, 1992 to comply with the *Workers Compensation Act*, as interpreted by the Appeal Division Decision No. 91-0850.

The Executive Committee accepted the Appeal Division's right to make the determination that the Board's authority to retroactively adjudicate a claim and thereby declare an overpayment was wrong in law.

The Committee considered various options with respect to retroactive application of the new overpayment policy. There was no administrative framework in place to deal with the issue of retroactivity. Subsequently, a comprehensive Board-wide policy regarding Retroactivity of Policy Changes was adopted by the governors on March 1, 1993. Some of the relevant highlights are as follows:

- In deciding the effective change of a policy change necessitated by a finding by the courts, the Appeal Division or another administrative tribunal that Board policy under the

Workers Compensation Act, the Criminal Injury Compensation Act, the Workplace Act or other statute is unlawful, the Board will have regard to the needs of good public administration.

- Good public administration involves a balance between fairness and the practicality of undoing prior transactions.
- In claims matters, regard must be had to the effect on workers in terms of benefits they may have lost or excess benefits they might have received which they might now be expected to repay. Regard must also be had to the effect on the employers in terms of possibly having to pay increased assessments or fund benefits which they should have paid in the past.
- The decision on retroactivity must be one which the Board is capable of properly administering without unduly increasing costs or affecting its general operation. The decision must not affect the Board's ability to properly fund the system.

The Executive Committee considered three primary criteria with respect to retroactivity. They were the moral, legal and administrative issues. After weighing these considerations, and bearing in mind the Board's lack of authority to create these overpayments in the past, the Committee selected January 1, 1980 as the date for retroactivity. As of January 1, 1980 computerized records of overpayments existed. Prior to that date, there were no overpayment records.

The governors' resolution of October 26, 1992 approved the retroactive implementation of changes in W.C.B. policy necessitated by the Appeal Division Decision No. 91-0850. The governors resolved that the policy amendments approved as of March 2, 1992 would apply as of January 1, 1980. As a result, the W.C.B. was, without application from workers and dependants, to refund all monies collected by the W.C.B. with respect to overpayments resulting from decisional errors where the decision declaring the overpayment was made on or after January 1, 1980.

Implementation of Governors' Decision

Process

Once the governors had approved the retroactive application of the new overpayment policy, an action plan was prepared by Compensation Services Division Management. From this plan the project was organized with the following considerations:

-
- A master list detailing all overpayments declared since 1980 was prepared from the Claims Overpayment Transfer Advice (C.O.T.A.) records.
 - A computer data base was designed to provide record keeping for the project. The records included the following: the date the overpayment was declared, the amount, the reason for the overpayment, the employer firm code, whether the overpayment is still outstanding, how much has been paid back, whether it is a decisional or administrative error, date refunded, amount refunded, and the amount of interest.
 - Liaisons were maintained with the Accounting and Assessment Departments to ensure the project would not negatively impact the Board's normal business.
 - Accounting procedures were developed, in consultation with the Accounting and Assessment Departments, to ensure that the repayment of decisional errors would not affect the experience ratings of employers.
 - No overpayment was refunded without checking to see if there was an outstanding overpayment still owing on another claim. If so, then this claim was reviewed to determine whether the refund should first be applied to that debt still owed to the Board.
 - The Accounting Department verified, where there was any uncertainty about the correct amount, overpayments to be refunded.
 - No interest was paid with respect to refunds for periods where there was an unpaid debt owing to the Board on another overpayment for the same person. This was to avoid paying interest to an individual for the same period where there was an outstanding debt.
 - Injured workers were contacted prior to sending refunds to ensure cheques were to be mailed to the correct addresses and to explain the reason for the refunds.
 - A memo indicating the project had evaluated the overpayment was placed on every file reviewed.
 - Decision letters were sent to the injured workers, with copies to the employers, advising of the amounts and details of the refunds.
 - A conscious decision was made to notify only those injured workers whose overpayments were found to be decisional. The new policy guidelines were applied and where the possibilities were evenly balanced, the issue was resolved in favour of the worker (as provided by Section 99 of the *Workers Compensation Act*).

Staffing

The decision-makers selected to work on this project came from the following positions: claims adjudicator (as project leader and resource person), claims officer 1, case assistant, payment clerk, claims information assistant, and desk clerk. The selection was done on the basis of seniority and operational considerations. The selection was assisted by input from the Compensation Employees' Union (C.E.U.), in view of considerations with respect to the *Collective Agreement*.

The experience levels of Board decision-making staff involved in the project ranged from 5 to 26 years. This wealth of Claims-related experience enhanced the success of the project.

Operational considerations dictated that some of the decision-making positions be staffed by temporary workers hired specifically for the duration of the project. Five temporary claims officer 2's were hired for a seven-month duration. Four temporary claims officer 1 decision-makers were hired for 2.5 months to do an initial screening of files. The addition of these staff was required to streamline the process and increase the number of file reviews. This initiative greatly improved the efficiency of the process and shortened the duration of the project.

Most support staff who worked on the project were full-time employees who were transferred from their regular positions for a minimum of three months. Their replacements in the Claims Units were temporary employees hired by the project. The support positions in the project were file clerks, phone control clerks and stenographers.

All staff who worked on the project completed a questionnaire that provided valuable insight into the problems that gave rise to overpayments in the past and are applicable to preventing future administrative and decisional errors. Extracts from the questionnaires provided anecdotal information for this report.

The staffing costs were as follows:

Decision-making staff	\$378,900
Support staff	68,200
Microfilm staff	68,900
Total	\$516,000

Note: The staffing cost total does not include the salary of the project manager who spent approximately 25% of his time on the project.

Logistics

Never before has the Board undertaken a file review project of this magnitude. At the outset it was estimated that the number of files requiring review would be about 20,000 (including 1992 claims). The precise number could not be determined until the C.O.T.A. list had been examined and a master list prepared. The final number was 27,443, including 1,439 decisions where the overpayment was previously cancelled. This is not exactly equal to numbers of claims, as the project's accounting tracked decisions that were reviewed. There were cases where there were more than one overpayment decision on a claim file. Each error was listed separately and it could be either decisional or administrative.

All overpayment files were reviewed by the project staff, regardless of whether the claims originated in Richmond or the Area Offices. This required a massive movement of files, as approximately 45% of the preserved files were from the Area Offices and were sent via courier. Once reviewed, the Area Office files were returned.

As most files dating before 1988 are available only on microfilm, the only way to view the files and make decisions was to recreate the files. The Microfilm Department recreated relevant portions of 10,999 claim files which resulted in 251,515 pages of microfilm documents. The Microfilm Department did an excellent job responding to the demands of the project.

Locating some clients was extremely difficult. As the overpayments were declared up to 13 years ago, many clients had moved several times and some were deceased. The project staff used a variety of methods to track down "missing" clients, including:

- The Board's claims registration system to check for recent claims
- The Board's pension address system, if the client had an ongoing pension
- Telephone books covering the province
- The Lower Mainland criss-cross directory
- The most recent employer was contacted to determine if the client was still employed.
- The most recent Provincial voters list
- I.C.B.C.'s and the Motor Vehicle Branch's computer vehicle and license registration systems

If all these failed, then a letter was sent to the last known address with the hope that there would be a forwarding address. Despite all these methods, at the end of the project there remained 519 refunds to be distributed with a total of \$161,000. The claims registration system has a flagging mechanism that will alert Board officers if and when one of these injured workers applies for compensation on a new claim or attempts to reopen an old claim. Through this method, a designated staff person will refund the undisbursed amounts.

Injured Worker Contact During the Project

The project staff attempted personal contact with all recipients of refunds prior to sending out the funds. This was an opportunity to explain the reason for the refund and was a good public relations exercise. Personal contact also gave the injured worker a chance to express his or her feelings about the original overpayment and the project. There was quite a range of reactions, some quite unexpected.

The most common reaction was that the injured worker was pleased to be getting a refund of a decisional error and he or she thanked the officers for the consideration. Several expressed the view that they saw this as the Board doing something positive. Others expressed a shocked disbelief and a few were convinced it was a prank and would not believe it until they had their cheques. That reaction is indicative of a lack of trust.

One injured worker broke down and cried on learning of his \$1,200 refund. His overpayment amount had changed four times as his claim had been readjudicated by several different adjudicators. The worker said he had been totally frustrated by the Board's bureaucracy and felt he never was given a satisfactory explanation of why there was an overpayment.

For one injured worker the refund came at a particularly good time as she had not worked in a long time and money was very tight. She was so happy that she gave the claims officer a "big hug" through the phone.

Another injured worker received the refund at a time when he was unemployed and wondering where next month's rent money would be coming from.

Many injured workers said they had experienced a difficult time fighting the overpayment through the appeals system and expressed the problems caused by the financial hardship. They said that it was about time the Board realized that workers should not be punished for errors made by the Board. The feelings of anger and bitterness were not dissipated for some by the fact that the money was being refunded. One even suggested that he was considering suing the Board for his lawyer fees resulting from his appeal of the overpayment.

From a public relations point of view, quite a few clients expressed an opinion that this project helped give a better view of the Board as an agency that is more approachable and fair.

Employer Contact During the Project

The project staff had less contact with employers, though some did receive refunds as the overpayments were charged against the employers who maintained the injured worker on salary during the period of disability. As it was explained that the payment of refunds would not affect their assessment rates, they rarely expressed strong feelings either way.

Larger employers were concerned with the amount of administrative work and expenses involved with the project, especially the amount of trouble project staff went through to locate clients. Some questioned the appropriateness of making this new policy retroactive.

The employers were very helpful to the project staff, even though asking employers to check their old records was quite an imposition.

Lessons Learned

From the project we realized the extent to which the Board's past method of declaring and recovering overpayments negatively affected our client group and ultimately the esteem to which the Board is held in the community.

The standard approach was done in a high-handed and less than courteous manner. Inadequate explanations were often given as to the cause of the overpayments. Poorly written letters were sent and they often did not provide many clues to the cause of the error and the decision seemed arbitrary. In many cases, overpayment amounts were revised numerous times, which lessened the injured worker's confidence that this was a carefully considered matter. The only clear message was that this amount had to be repaid. The issue of fairness was often lost in the process.

It is necessary for the Board to treat injured workers and employers with respect in all aspects of claim dealings, including overpayments.

The negative manner in which many clients described their dealings with the Board is not meant as an indictment of the Compensation Services staff. The staff were in most cases following standard Board practice in their method of dealing with overpayment issues. The work often was performed under difficult conditions due to high case loads. A large portion of the work was found to be of high quality and the staff are to be commended.

Observations

Training and Quality Assurance Issues

Many conclusions have been formed following the project's review of the thousands of historical overpayments. These observations have been submitted to the Training and Education Department and to Compensation Services Management for a review of our current training programs and overpayment procedures.

The following are issues requiring consideration:

- The most common error is the payment of wage loss while the injured worker is back to work. This represented 54% of administrative errors and 46% of all errors. To reduce these errors, procedures should be in place to ensure close contact is maintained with the injured worker, the employer, and the doctor. The claims staff should not make assumptions about expected return-to-work dates without verification, as the large volume of these overpayments shows that this is the cause of the majority of overpayments. The employer needs to be contacted to corroborate the return to work rather than relying on the doctor's report, which indicates work fitness.
- Maintaining a close contact with the injured worker would also help avoid the situation where benefits are paid past the date of medical proof of disability, when there has not been a resumption of work. This is the largest category of decisional errors as it represents 47% of decisional errors and 7% of all errors.
- Increased training is required in rate setting for both initial rate setting as well as the eight-week rate change. There is currently a lack of consistency in the method of rate setting for self-employed workers.
- Increased use of provisional rates, with properly communicated decisions, to avoid setting arbitrary rates pending the receipt of additional wage information. This would avoid a decisional error when the wage rate is finalized.
- The standard letters for overpayments need to be revised with emphasis placed on plain language and more empathy. Currently, the same letter is sent to all injured workers regardless of the amount or the reason for the overpayment. Custom letters should be sent in cases of complex overpayments.
- Staff require additional training to ensure consistency of decision making regarding differentiating between decisional and administrative errors.

Training recommendations for collection of future administrative errors:

- A phone call informing a client of an overpayment is advisable, where possible, both to provide a careful explanation as well as from a customer service viewpoint. This would, in all cases, be followed up by a decision letter that is clear in the reasons for the overpayment. The letter should be free of Board jargon.
- More careful follow-up on administrative overpayments including better liaisons with the Collections Department, Accounting Department, and the Legal Services Division. This is to avoid situations where the appropriate procedures are not being followed. An example is where the overpayment notifier is not being removed from the computer registration system after full restitution has been made. In some cases payments have been made and the overpayment not reduced accordingly. There have also been multiple claims paid without deducting an outstanding overpayment.
- Interest should not be mentioned in the overpayment letters if there is no intention to enforce an interest penalty.

General Recommendations

The following recommendations have been forwarded to the vice-president Compensation Services for his consideration:

- Improved file management and control.
- Improved file documentation to clarify the reason for the overpayment.
- Overpayments checked by a co-worker for accuracy prior to notifying the client.
- Claims staff need to maintain more contact with injured workers, employers, and doctors.
- In each area, develop and maintain overpayment “experts” who can advise and assist staff to ensure consistency. This would be an excellent duty for the resource adjudicator.
- Consistency of rate setting between the wage-loss and pension rates.
- Reduction of case loads, which would foster a better relationship between the adjudicator and the client, rather than treating a client simply as a number.

Recommendation for Closure on the Project

As all historical overpayments dating from January 1, 1980 have been identified and dealt with, the Board's involvement with the project is for all intents and purposes over. The only exception is the outstanding decisional errors requiring disbursement to injured workers who the project team have been unable to locate. This matter has been dealt with by the identification of these claims on the registration system. Should these individuals have a claim in the future or re-open an old claim, the benefits due to them will be disbursed at that time.

Therefore, it is requested that closure be affected to this project immediately.

Report prepared by Jay Rowland, manager, on behalf of Len McNeely, vice-president Compensation Services Division.

Appendices

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|--------------------|---|
| Appendix #1 | Statistical summary of the findings of the project |
| Appendix #2 | Frequency of errors (administrative and decisional) |
| Appendix #3 | A study of overpayments by year declared |
| Appendix #4 | Sample overpayments |

Appendix 1 — Statistical Summary

1. Decisions Reviewed by the Project

		Percentage
Number of administrative errors	21,901	84%
Number of decisional errors	4,103	16%
	Total	26,004
		100%
Amount of administrative errors	\$ 8,954,000	76%
Amount of decisional errors	\$ 2,763,000	24%
	Total	\$11,717,000
		100%
Decisional errors refunded	\$ 1,281,000	
Interest paid on refunded decisional errors	\$ 1,015,000	
	Subtotal	\$ 2,296,000
Decisional (\$) cancelled by the project	\$ 1,321,000	
	Total	\$ 3,617,000
Number of refunds issued	2,263	
Average amount per refund	\$ 566	
Number of interest cheques issued	1,943	
Average amount per interest cheque	\$ 522	

2. Decisional Errors Where Injured Worker Not Located

Number of decisional errors (included above)	519	
Amount identified but not dispersed	\$ 161,000	

3. Miscellaneous Decisions Reviewed

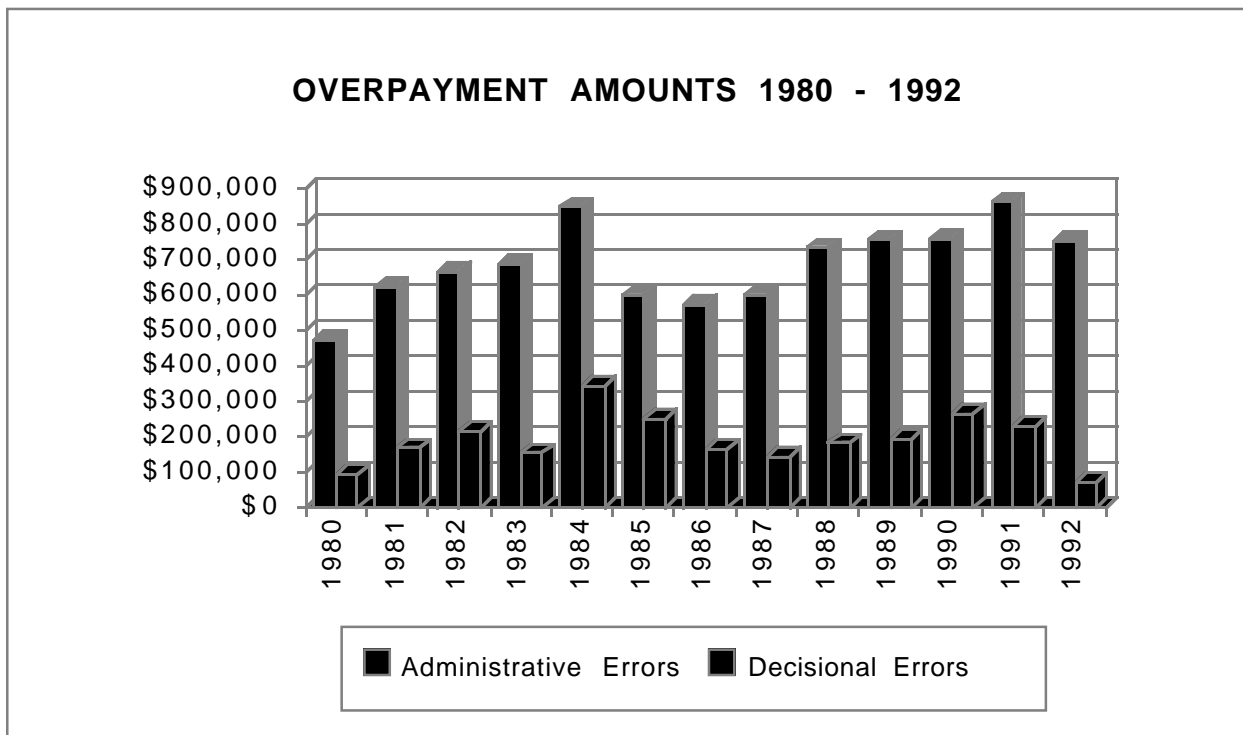
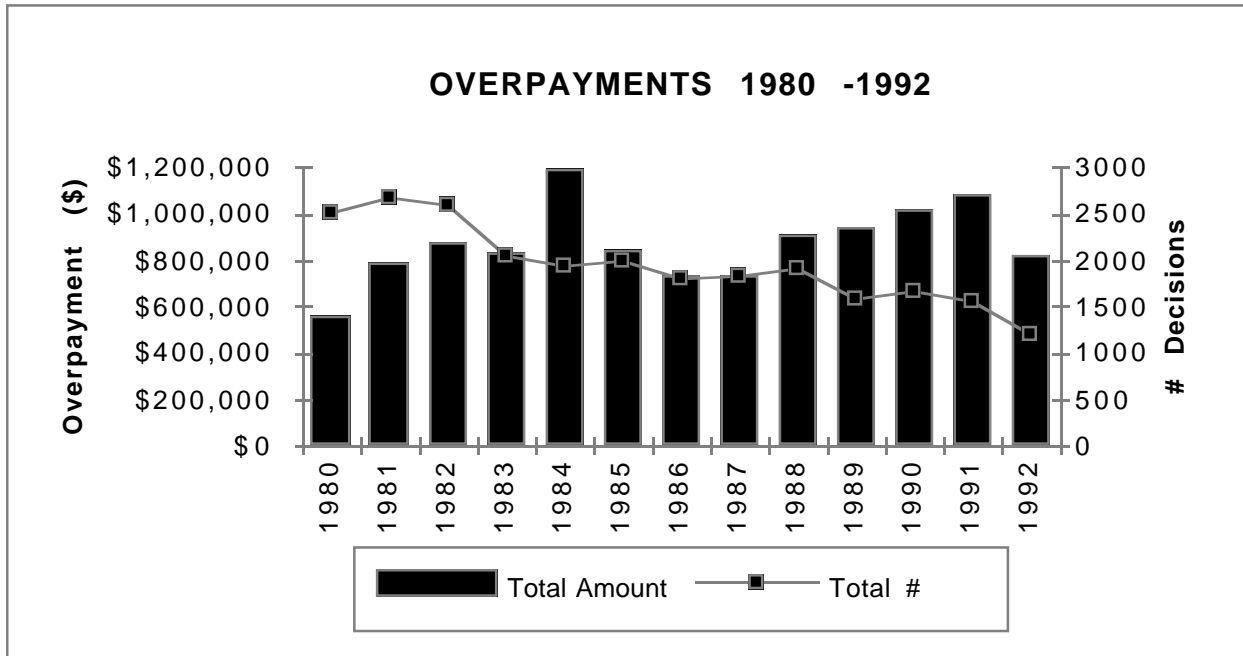
Number of previously cancelled overpayments	1,439	
Amount of previously cancelled overpayments	\$ 2,305,000	
Number of overpayments reviewed where the overpayment was declared before Jan. 1, 1980	1,623	

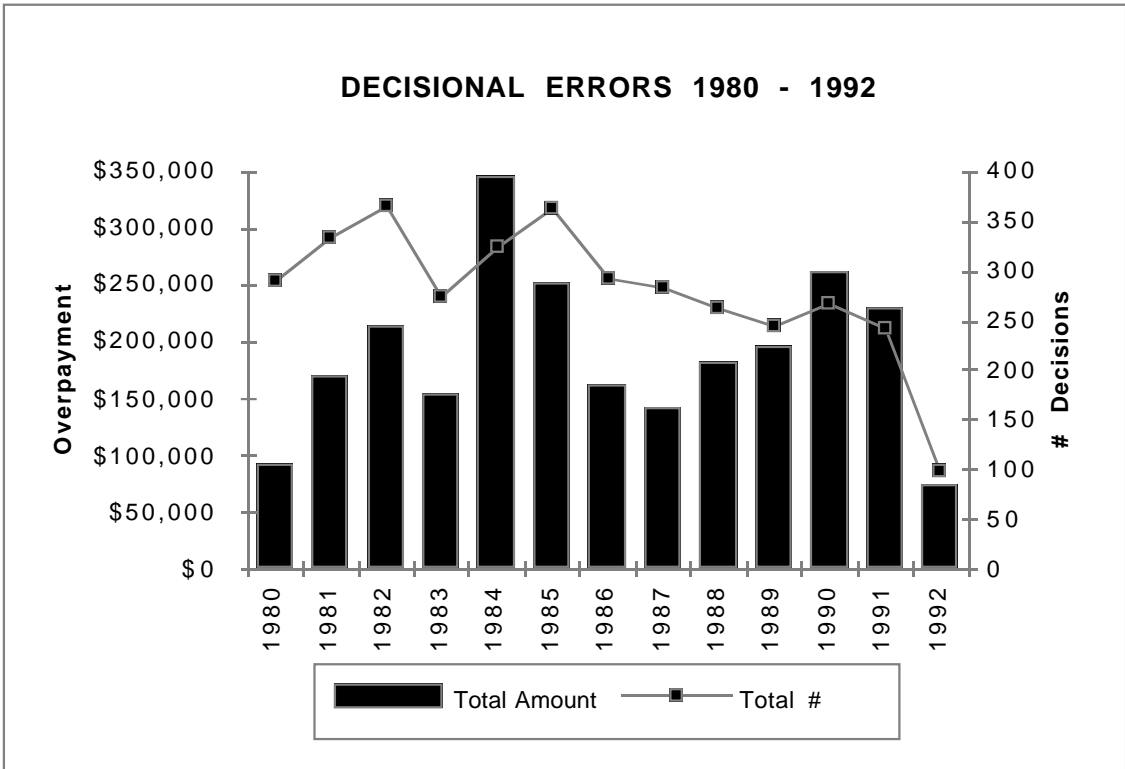
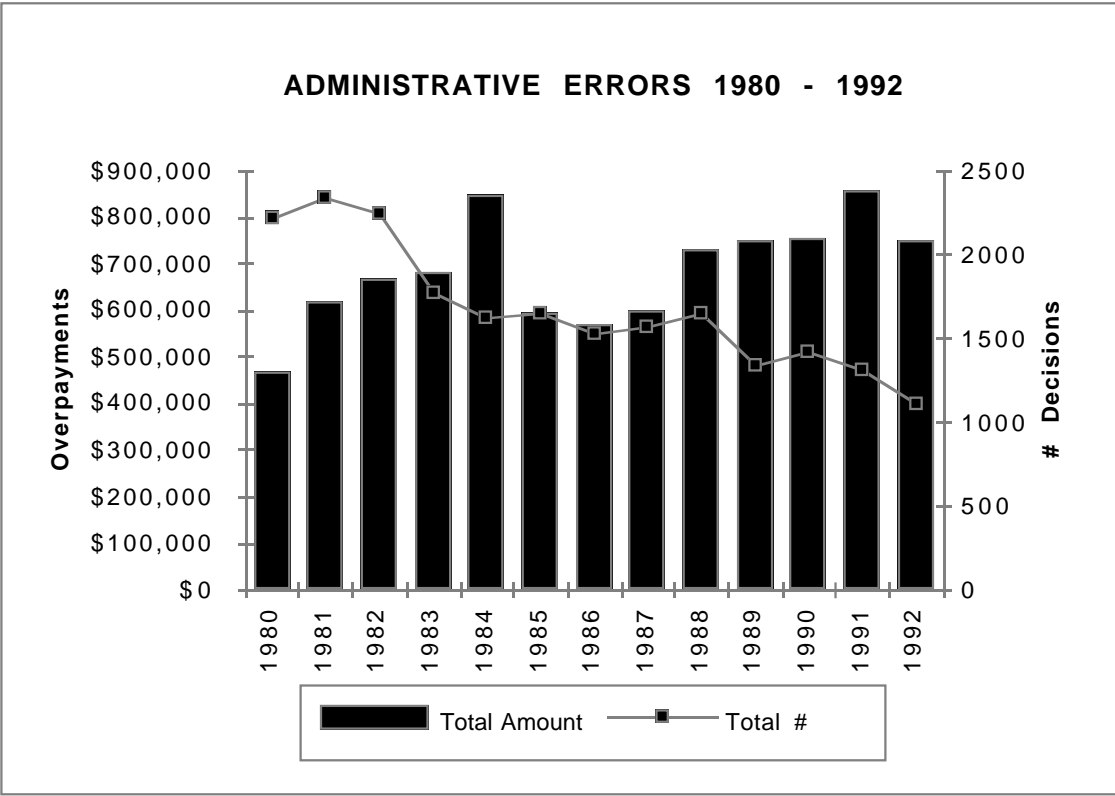
Appendix 2

Retroactive Adjudication Project — Frequency of Errors

	Administrative Errors	Number	% of Admin. Errors	% of All Errors	Amount
1	Benefits paid beyond the date of return to work	11,845	54%	46%	\$2,810,763
2	Injured worker paid more than once for the same period	1,165	5%	4%	\$561,903
3	Incorrect shift or return to work information from employer	1,149	5%	4%	\$231,852
4	Mathematical error in calculating the wage rate	1,113	5%	4%	\$500,552
5	Error paying benefits (wrong dates or amounts inputted)	1,044	5%	4%	\$435,254
6	Benefits paid to the wrong payee	958	4%	4%	\$661,586
7	Outside the statutory authority of the Board	937	4%	4%	\$198,090
8	Earnings while receiving benefits (not fraud)	749	3%	3%	\$580,235
9	Wage rate incorrect due to wrong information from employer	741	3%	3%	\$349,537
10	Fraud or misrepresentation	502	2%	2%	\$1,940,598
11	Health Care Benefits error	395	2%	2%	\$67,440
12	Claim paid on incorrect work week	319	1%	1%	\$52,638
13	Clerical error while implementing officer or Appellate decision	214	1%	1%	\$99,950
14	Other	770	4%	3%	\$463,535
	TOTAL	21,901	100%	84%	\$8,953,933
	Decisional Errors	Number	% of Decisional Errors	% of All Errors	Amount
1	Claim readjudicated based on medical report. Worker had not r.t.w.	1,921	47%	7%	\$354,754
2	Readjudication of the wage rate	631	15%	2%	\$890,891
3	Missed or late 8 or 13 week rate change	567	14%	2%	\$450,423
4	Readjudication of entitlement	284	7%	1%	\$505,811
5	Error in setting principal's wage rate	167	4%	1%	\$195,981
6	Initial wage rate set too high (no provisional rate set)	67	2%	0%	\$24,187
7	Other	466	11%	2%	\$340,810
	TOTAL	4,103	100%	16%	\$2,762,857

Appendix 3





Appendix 4

Sample Overpayments

1. Largest Decisional Error

The largest decisional error identified was \$23,000 and was caused by a readjudication of the wage rate in 1985. The overpayment was recovered in full in 1989 from the injured worker's pension on another claim. The claimant has moved several times since 1985 and was located in Prince George. The amount of the interest payment was \$9,755.76.

2. Example of Administrative Error

An injured worker cut his right hand on March 13, 1984. The first medical report did not indicate the length of total disability anticipated. The initial wage-loss cheque was processed on April 5, 1984 for the period March 14 to April 1 inclusive. The next cheque was processed April 16 for the period April 2 to April 15 inclusive. This cheque was issued after two phone calls to the employer had failed to confirm whether the injured worker had returned to work.

A call from the injured worker's mother on May 1 advised that the worker had returned to work April 10. This resulted in an overpayment of four days in the amount of \$256.68, as an injured worker cannot receive wage-loss while working. The overpayment was paid in full by the injured worker on May 15, 1984.

3. Example of Decisional Error

A 53-year-old fisher injured his right knee in 1985 when he fell on his fishing boat. The wage rate was set on his claim using the earnings he made in the 109 days of the previous year when he was fishing. The remainder of that year the injured worker was disabled as a result of another work injury. A later decision by a claims adjudicator based the wage rate on the injured worker's earnings over five years. As a result of the readjudication of the wage rate, an overpayment of \$8,328.90 was declared. The injured worker had a pension arising out of the knee injury, and his pension was commuted to recover the overpayment.

As a result of the review by the project, \$8,328.90 was refunded with \$4,959.76 in interest.

