Gorham #4
Sworn April 8, 2015

No. C965349
Vancouver Registry

IN THE SUPREME COURT OF BRITISH COLUMBIA

BETWEEN:

ANITA ENDEAN, as representative plaintiff

PLAINTIFF

AND:

THE CANADIAN RED CROSS SOCIETY, HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA, AND THE ATTORNEY GENERAL OF CANADA

DEFENDANTS

AND:

BRITISH COLUMBIA CHILDREN'S HOSPITAL, PRINCE GEORGE REGIONAL HOSPITAL, DR. WILLIAM GALLIFORD, DR. ROBERT HART DYKES, DR. PETER HOUGHTON, DR. MICHAEL W.H. PATTERSON, DR. JACQUES GERARD LEBLANC, DR. JACOBUS KOOY, DR. JOHN DOE, HER MAJESTY THE QUEEN IN RIGHT OF CANADA, AND HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA

THIRD PARTIES

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA AND THE CANADIAN RED CROSS SOCIETY

THIRD PARTIES

AFFIDAVIT OF PETER GORHAM
(Sworn April 8, 2015)

Jasvinder S. Basran
Senior Regional Director
Department of Justice Canada
Per: Lindsay Morphy
900 – 840 Howe Street
Vancouver, British Columbia
V6Z 2S9
Telephone: (604) 666-8261
Facsimile: (604) 666-7713

Solicitor for the Defendants,
The Attorney General of Canada

Ministry of Attorney General
Legal Services Branch
Per: Keith A. Johnston/Clifton Prowse
1301 - 865 Hornby Street
Vancouver, B.C. V6Z 2H4
Telephone: (604) 660-3093/(604) 660-3091
Facsimile: (604) 660-2636/(604) 660-2636

Camp Fiorante Mathews
Barristers and Solicitors
Per: J.J. Camp, Q.C.
4th Floor, 555 West Georgia Street
Vancouver, B.C. V6B 1Z6
Telephone: (604) 689-7555
Facsimile: (604) 689-7554

MacKenzie Fujisawa
Barristers and Solicitors
Per: William A. Ferguson
1600 - 1095 West Pender Street
Vancouver, British Columbia
V6E 2M6
Telephone: (604) 687-3216
Facsimile: (604) 685-6494

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THIRD PARTIES

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA AND THE CANADIAN RED CROSS SOCIETY

THIRD PARTIES

AFFIDAVIT OF PETER GORHAM
(Sworn April 8, 2015)

I, Peter Gorham, of the Town of Whitby, in the Province of Ontario, MAKE OATH AND SAY AS FOLLOWS:

1. I am a fellow of both the Canadian Institute of Actuaries and the Society of Actuaries, which is the professional association for actuaries in the United States of America. I attained my designation as Associate, Society of Actuaries, in 1977 and attained both fellowships as an actuary in 1980.

2. I am an experienced actuary having spent my professional career providing pension benefits and actuarial consulting services to numerous clients across Canada. I also teach pension courses at the Humber College Centre for Employee Benefits (C.E.B.). As such, I have knowledge of matters to which I hereinafter depose.

3. In 1976, I graduated from the University of Toronto with a Bachelor of Sciences in Actuarial and Computer Sciences.

4. I began my actuarial career with Crown Life Insurance Company, where I worked as a pension administrator and an actuarial assistant specializing in pensions and group insurance. I began working at MLH + A inc. (now Aon Consulting) in 1978 as an Associate Actuary, serving clients in the area of pension and employee benefits.

5. I continued working at MLH + A Inc. until 1998 becoming a partner in that firm in 1989. I joined Morneau Sobeco (now Morneau Shepell) as a partner in 1998. Morneau Shepell is a firm with over 2,500 employees throughout Canada and the United States. Morneau Shepell provides integrated human resource services to a wide range of clients. The firm has very large and active practice groups in the fields of asset management, benefits, compensation, disability management and employee assistance programs, which provide actuarial and other services pertaining to pensions, employee benefits and

compensation plans. My practice focuses on the design, financing, administration and governance of pension and benefit plans. This includes costing and valuations of pension plan benefits and advice, as well as valuations of pension and benefits obligations for funding and accounting purposes.

6. I retired from Morneau Shepell in June 2011 and commenced working for JDM Actuarial Expert Services Inc as president and actuary. I continue to provide consulting services as a contractor to Morneau Shepell and it is in that capacity that I provide expert witness services in this matter.

7. I have been a member and served as a director of numerous pension-related councils and committees. For example, from 1988 to 1994, I sat on the Pension Review Council, an advisory group of the largest pension and legal firms in Canada. I was a founding director of the Multi-Employer Benefit Plan Council of Canada from 1992 to 1993. I recently completed an appointment as the lead member of the Capital Accumulation Plans Industry Task Force which was constituted to provide advice to the Joint Forum of Financial Market Regulators.

8. I have provided evidence as an expert witness in in the Superior Court of Ontario for a class action related to alleged excessive credit card interest charges of a major Canadian financial institution. In addition, I have provided expert evidence for the assessment of investment based damages payable on administered funds held by the Federal Government over an 85 year period, a class action against a number of pay-day loan companies, two constitutional challenges to the Ontario Workplace and Safety Insurance Board regarding benefit entitlement for disabled seniors, and on matters related

to the valuation of pensions for family law purposes, life estates valuations, the present value of future income and care costs, as well as other actuarial areas. In testifying, I have appeared before various Courts in Ontario, the Ontario Employment Standards Tribunal, the Ontario Workplace Safety and Insurance Tribunal and the Canadian Institute of Actuaries Disciplinary Tribunal.

9. Attached as Exhibit "A" to this my affidavit is a copy of my *curriculum vitae.*

10. Morneau Shepell was retained by Canada to prepare an actuarial valuation of the 1986-1990 Settlement Fund for use in the sufficiency review of that fund as of 31 December, 2013. I previously had been engaged by Canada to prepare similar reports as of 31 December, 2004, December 31, 2007 and December 31, 2010 as part of the sufficiency hearings as of those dates although it had not been necessary to complete the report of December 2007 at that time.

11. The Morneau Shepell retainer in respect of the actuarial valuation of the 1986-1990 Hepatitis C Compensation Fund as of December 31, 2013 required that we:

a. provide an evaluation of the financial position of the Fund as of 31 December 2013 for support of the 2013 Sufficiency Hearings;
b. provide an analysis of actual to expected experience for the three years from 31 December 2010 to 31 December 2013;
c. provide an independent review of the 2013 actuarial report prepared by Eckler Partners for the Joint Committee ("the Joint Committee") established under section 9.01 of the January 1, 1986 to July 1, 1990 Hepatitis C Settlement Agreement (the "Plan");

d. provide an evaluation of the sensitivity of the valuation results to changes in the key actuarial assumptions; and

e. provide information to the Federal Government to assist them in reviewing their position with respect to the Fund.

12. For this valuation we were instructed to work cooperatively with Eckler including the joint selection of actuarial methods and assumptions. The intent is to use the same assumptions in our respective valuations provided that did not result in compromising our professional integrity or result in using assumptions that we believed were inappropriate for the purpose. We co-operated with the analysis of the data and shared our respective findings. Both Eckler and Morneau Shepell accept all of the assumptions used in this valuation – there are no differences.

13. Eckler and Morneau Shepell have shared their respective results and in our opinion, the differences are immaterial and the results should be considered as essentially the same.

14. For the purpose of the 2013 sufficiency review I have annexed hereto and attached as Exhibit "B" to this my affidavit the Morneau Shepell report assessing the fund as of December 31, 2013.

15. I hereby certify that:

a. in my opinion, the Fund is sufficient as of 31 December 2013;

b. in my opinion, the data used is sufficient and reliable for the purposes of the report;

c. in my opinion, the actuarial methods are appropriate for the purpose of this

report;

d. in my opinion, the assumptions used are, in aggregate, appropriate for the purposes of the work;

e. the calculations were prepared in accordance with the Canadian Institute of Actuaries' Standards of Practice;

f. my report has been prepared and my opinions given in accordance with accepted actuarial practice in Canada;

g. there are no subsequent events other than those discussed in my report that I am aware of that would have an impact on the results presented therein; and

h. my report conforms to my duty to:

   i. provide opinion evidence that is fair, objective and without advocacy for either party and related only to matters that are within my area of expertise;

   ii. if called upon to give oral evidence or written testimony, I will give that testimony in a fair, objective manner and without advocacy for either party; and

   iii. assist the court and provide such additional assistance as the court may reasonably require to determine the matter at issue.

16. I make this affidavit in response to the plaintiffs' material prepared in support of the fund sufficiency motion.

Sworn before me at the City of)
Toronto, in the Province of Ontario,)
this 8th day of April, 2015.)
)
)
)

A Commissioner for taking affidavits
within the Province of Ontario
and Notary Public

Peter Gorham

This is Exhibit "A" mentioned and referred to in the affidavit of PETER GORHAM

Sworn before me this 8 day of APRIL A.D. 2015

A Commissioner for taking affidavits

Curriculum Vitae of Peter J. M. Gorham

Professional Designation

Fellow, Canadian Institute of Actuaries

Fellow, Society of Actuaries

Employer

JDM Actuarial Expert Services Inc., President & Actuary

Education

1972 - 1976: University of Toronto, B.Sc.

- Majoring in Actuarial Science and Computer Science

1973 - 1980 Actuarial studies

- Attained ASA (Associate, Society of Actuaries) in 1977
- Attained FSA (Fellow, Society of Actuaries) and FCIA (Fellow, Canadian Institute of Actuaries) in 1980

Employment History

1968 – 1972 Microsec 69 Limited

- Summer employment as a pension administrator

1973 – 1976 Crown Life Insurance

- Summer and part-time employment as an actuarial assistant for U.S. group insurance and pensions

1976 – 1978 Crown Life Insurance

- Full-time employment as an actuarial student working with U.S. group insurance and pensions

1978 – 1998 Aon Consulting - (formerly MLH + A inc and K. G. Brown Associates)

- Pension and Actuarial consultant providing advice to corporations, public organizations and unions on their pension and benefit plans
- Provided expert testimony services to the legal profession for loss of income and marriage breakdown matters
- 1987, K. G. Brown merged with MLH + A inc.
- 1989, appointed partner of MLH + A inc.
- 1997, MLH + A inc merged with Aon Consulting

1998 – 2011 Morneau Shepell Inc (formerly Morneau Sobeco)

- partner
- Pension and Actuarial consultant providing advice to corporations, public organizations and unions on their pension and benefit plans
- Provide expert testimony in legal proceedings involving criminal interest, wrongful dismissal, future care costs and cases involving a quantification of the effects of risk.

2011 – present JDM Actuarial Expert Services Inc.

- President and actuary
- Pension and Actuarial consultant providing advice to corporations, public organizations and unions on their pension and benefit plans
- Provide expert testimony in legal proceedings involving criminal interest, wrongful dismissal, future care costs and cases involving a quantification of the effects of risk.

Responsibilities

- Pension and group insurance consulting to corporations. Clients range from small (under 25 employees) to large (over 1,000 employees)
  - Design and implementation of pension plans, including plan documentation, design of administration and employee communications
  - Design and implementation of pension plan
  - Review of plan governance and consulting on effective plan governance
  - Interpretation of plan terms and applicable law for specific situations clients face
  - Costings and valuations of pension plans and benefits.
  - Advice and valuations of pension and benefit obligations for funding and accounting purposes
  - Advice and costings for union negotiations
  - Advice and costings for pension and benefit issues in corporate mergers and acquisitions
  - Employee communications
- Pension and group insurance consulting to Multi-Employer plans. Clients are trusteed multi-employer pension and benefit plans
  - Design and implementation of pension plans, including plan documentation, design of administration and employee communications
  - Design and implementation of pension plan and group insurance plan amendments
  - Review of plan governance and consulting on effective plan governance
  - Interpretation of plan terms and applicable law for specific situations clients face
  - Costings and valuations of pension plans and benefits
  - Member communications

- Expert Witness services
  - Family law valuations to determine the value of pensions (prior to 1999)
  - Present value of future income and future care costs
  - Valuation of lost pension, benefits and compensation in cases of wrongful termination or retirement
  - Valuation of life estates
  - Valuation of present value of future support payments
  - Valuation of present value of future compensation payments for Hepatitis C 1986-1990 Compensation Fund and the lump sum compensation amounts for the Hepatitis C pre-1986 and post-1990 Class Settlement.
  - Determination of appropriate investment returns to consider applying to trust funds maintained by Canada on behalf of disabled veterans for Authorson v. Attorney General for Canada
  - Certifications of criminal rate of interest, including
    - Markson v MBNA Canada Inc: a class action alleging a criminal rate of interest was charged on various cash advances using a MBNA Mastercard; and
    - Margaret Smith and Ron Oriet vs National Money Mart Company and Dollar Financial Group Inc. as well as Gareth Young v. National Money Mart and H. Craig Day v. National Money Mart et al.
  - Review of the effect of workers' compensation benefit cessation after two years of benefit following age 65 for an alleged breach of the Charter of Rights and Freedoms in Daniel Gouthro v. Workplace Safety and Insurance Board and in Jacques Rochon v. Workplace Safety and Insurance Board
  - Report on the selection of an appropriate discount rate for valuing future care costs and loss of income in Trinidad and Tobago
  - Report on the selection of an appropriate discount rate for valuing future care costs and loss of income in Bermuda
  - Valuations and/or reviews of situations involving the present value of future contingent events
  - Expert testimony provided to
    - Unified Family Court of Ontario
    - Superior Court of Justice for Ontario
    - Supreme Court of British Columbia
    - Court of Queen's Bench of Alberta
    - Superior Court of Quebec
    - High Court of Justice of Trinidad and Tobago
    - Supreme Court of Bermuda
    - Ontario Employment Standards Tribunal
    - Ontario Workplace Safety and Insurance Tribunal

- Canadian Institute of Actuaries Disciplinary Tribunal

- Education and training of actuarial assistants and pension administrators. Direct the preparation of summaries and explanations of current issues for professionals.

Professional Associations and Committees

- Canadian Institute of Actuaries
- Society of Actuaries
- Association of Canadian Pension Managers
- Canadian Pension and Benefits Conference
- Society of Actuaries, Education and Examination Committee 1981-1990
  - Writing and marking of actuarial examinations for Canadian pension topics
  - 1986 - 1990 was chairperson for Canadian Pension exam (Part 10) and also responsible for recommending new topics and study material
- Canadian Institute of Actuaries, Continuing Professional Development Committee, Chairperson, 1991 – 1994
  - Responsible for designing initial standards for continuing professional development
- Canadian Institute of Actuaries Program Committee, 1989 – 1993
  - Design program and recruit speakers for CIA conferences
- Canadian Institute of Actuaries Task Force on proposed pension standards requiring plan advisors to report non-compliance to regulators – 2003 – 2005
- Canadian Institute of Actuaries Committee on Relations With Other Professions on Pension Matters, 2004 – 2005
- Recipient of Canadian Institute of Actuaries' Silver Award for volunteer service – 2005
- Pension Review Council, 1988 – 1994
  - Industry group comprised of largest pension consulting firms and legal firms in Canada
  - Provide advice to regulators and liaison between industry and pension regulators
- Multi-Employer Benefit Plan Council of Canada (MEBCO)
  - Multi-Employer industry group to provide advice to regulators and act as liaison between plan trustees and regulators
  - Founding director, 1992 – 1993
- Humber College, Centre for Employee Benefits, Industry Advisory Committee, 1988 – 1994
- Canadian Institute of Actuaries – member of the 2009 Pension Review Task Force, which was charged with reviewing actuarial reports on the wind up of pension, plans for compliance with professional standards and legislative requirements. - 2012
- Capital Accumulation Plans Industry Task Force advising the Joint Forum of Financial Market Regulators regarding guidelines for Capital Accumulation Plan Administration, 2002 – present

- Chair for the CAP Guidelines Fees Disclosure Industry Working Group, 2012

- Canadian Institute of Actuaries – research project into the discount rates for determining the present value of future pecuniary losses, 2014.

Publications

- K. G. Brown Memorandum, author 1985 – 1987
  - Newsletter of current issues for clients and friends of the company
- MLH + A Actualities, editor 1989 – 1994
  - Newsletter of current issues for clients and friends of the company
- Canadian Benefits Administration Manual, editor 1989 – 1994
  - Looseleaf service published by Carswell for pension and benefits plan administrators
- Benefits Canada: "Ode to Insurance Rating", December 1994, with J. M. Norton
- Benefits Canada: "Safety in Numbers", December 1995, with David Glover
- Benefits Canada: "Great Expectations", August 1996, with Robert Brunelle
- Benefits Canada: "Paying for the Bills", December 1996, with Keith Morrallee
- Benefits Canada: "Adventures in Compensation – Profit Sharing Plans", May 1999
- DC Pension Members' Newsletter, Morneau Sobeco: "What is Long Term?", July 1999
- Morneau Sobeco Vision: "Retirement Trends in Canada – An Overview", Oct 1999, with Fred Vettese
- DC Pension Members' Newsletter, Morneau Sobeco: "What's up With My Investments?", Apr 2000
- The Canadian Institute: "Using Technology for Efficient, Convenient Pension Communication", Jul 2000
- Benefits Canada: "Balancing Act" – An Alternate View of Risk for DC Pensions, Jan 2001
- Morneau Sobeco Vision: "Our Inaugural DC Survey Results – Plan Members Speak Out", Mar 2001, with Fred Vettese
- Benefits Canada: "Viewpoint – Searching for a Safe Harbour", Oct 2001
- Benefits Canada: "Investment Information for DC Plan Members", Oct 2002
- Benefits and Pension Monitor: "Testing DC Members, Can They Make the Grade?", Feb 2004
- Morneau Sobeco Vision: "Retirement Trends in Canada – 5 Years Later", Feb 2004, with Fred Vettese
- Benefits & Pension Monitor: "Governance Audits", Apr 2005
- Morneau Sobeco News & Views: "OECD Investment Guidelines on Pension Fund Asset Management", Mar 2006
- Canadian HR Reporter: "The Best of Both Worlds", May 2007

- Morneau Sobeco News & Views: "Baby Boomers Aren't Saving Enough", Aug 2007
- JDM Actuarial Expert Services: "The Criminal Rate of Interest", Aug 2011
- JDM Actuarial Expert Services: "Life Expectancy", Sep 2011
- JDM Actuarial Expert Services: "Selecting a New Consultant", Nov 2012
- Benefits & Pension Monitor: "Selecting a New Consultant", May 2013

Seminars and Conferences

- "Pension Issues around the World - Canada" - Society of Actuaries, San Diego, 1988
- "Pension Adjustments and RRSP Contributions" - CCH/ACPM Conference, Toronto, 1988
- "Why Bother With Defined Benefit Plans" - Richard DeBoo Conference, Toronto 1990
- "Pension Fund Investment Management and the New Rules" - ACPM Conference, Vancouver, 1991
- "Pension Fund Investment Management" - Canadian Association of University Business Officers, Montreal, 1991
- "Pension Legislation - A Cross-Canada Review" - Richard DeBoo Payroll Conference, Toronto, 1991
- "Family Law Act and Pensions" - Estate Planners Council of Hamilton, Hamilton, 1991
- "Pension Plan Design for the 1990's" - MLH + A Client Seminar, Hamilton, 1992
- "Pension Reform Across Canada" - Richard DeBoo Payroll Conference, Toronto, 1992
- "Pension & Benefits Checklist" - Carswell - Employment Law Update, Toronto, 1992
- "Pension Act Compliance" - Canadian Institute of Actuaries, Montreal, 1993
- "Continuing Professional Development" - Canadian Institute of Actuaries, Montreal, 1993
- "Tax Assisted Retirement Savings" - Carswell Payroll Conference, Toronto, 1993
- "Benefits Basics - Funding Group Insurance Plans" - Benefits Canada and Canadian Pension & Benefits Conference, Toronto, 1995
- "Demographics and the Social Security Crunch" - MLH + A Seminar, Toronto, 1996
- "Actuarial Issues" - Seminar for Continuing Professional Development of Life Underwriters Association of Canada, Toronto, January - February 1997
- "Pension Trends and Predictions" - Morneau Sobeco Trends and Projections Seminar, September 1999
- "Retirement Planning" – Benefits Canada DC Plan Summit, January 2000
- "Using Technology for Efficient, Convenient Pension Communication", The Canadian Institute, Jul 2000
- "Effective Tax Strategies for Pensions in Canada" – Fundamentals of Canadian Employee Benefits, International Foundation of Employee Benefits Plans, August 2000
- "Pension Trends and Predictions" - Morneau Sobeco Trends and Projections Seminar, September 2000

- "Saying Good Bye to Boomers – Demographics and Our Benefits System" – HRPAO Conference, November 2000
- "Plan Members Speak Up" – Benefits Canada DC Plan Summit, January 2001
- "Pension Governance – Course 2" – Federated Press, Course Leader with Eilonwy Morgan, April 2001
- "Retirement Planning" – HRMA/Worldatwork Conference, June 2001
- "Pension Trends and Predictions"- Morneau Sobeco Trends and Projections Seminar, September 2001
- "Fundamentals of Pension Governance", Pre-Conference workshop, Canadian Institute National Forum of Pension Governance, with Elizabeth Boyd, Blake Cassels & Graydon LLP, January 2002.
- "Pension Governance – A Strategy" - Morneau Sobeco Emerging Trends Seminar, April 2002
- "Pension Liability: Do You Know What Your CFO Is Doing Today?" – Federated Press workshop, Pension Governance Conference, June 2002
- "Fundamentals of Pension Governance in Canada" – Canadian Institute Course, co-leader with Elizabeth Boyd, Blake Cassels & Graydon LLP, July 2002
- "Pension Trends and Predictions" - Morneau Sobeco Trends and Projections Seminar, September 2002
- "Fundamentals of Pension Governance in Canada" – Canadian Institute Course, co-leader with Elizabeth Boyd, Blake Cassels & Graydon LLP, November 2002
- "Impact of Pension Funds on Financial Statements" – Federated Press Conference on Forestalling Pension Fund Shortfalls, Session Chair and Presenter, March 2003
- "Pension Plan Financial Risks on Corporate Earnings" – Federated Press Conference on Forestalling Pension Fund Shortfalls, Post Conference workshop, March 2003
- "Changing Face of Governance" - Morneau Sobeco Emerging Trends Seminar, April 2003 and June 2003
- "Fundamentals of Pension Governance in Canada" – Canadian Institute Course, co-leader with Elizabeth Boyd, Blake Cassels & Graydon LLP, July 2003
- "Pension Trends and Predictions"- Morneau Sobeco Trends and Projections Seminar, September 2003
- "Governance Roundtable" – Morneau Sobeco Roundtable discussion, November 2003
- "Negotiating Pension and Benefits" – panel member, Lancaster House, Bargaining in the Broader Public Sector, November 2003
- "Pension Governance – Performing a Governance Audit" – Federated Press Pension Governance Conference, with Andrew Harrison, Borden Ladner Gervais, April 2004
- "Pension Plans at Risk" - Morneau Sobeco Emerging Trends Seminar, April 2004
- "Fundamentals of Pension Governance in Canada" – Canadian Institute Course, co-leader with Elizabeth Boyd, Blake Cassels & Graydon LLP, July 2004
- "Pension Trends and Predictions"- Morneau Sobeco Trends and Projections Seminar, September 2004

- "Investment Risk Roundtable" – Morneau Sobeco Roundtable discussions, November/December 2004
- "Pension Governance – Performing a Governance Audit" – Federated Press Pension Governance Conference, with Sonia Mak, Borden Ladner Gervais, April 2005
- "Measures of Defined Contribution Plan Success" – Canadian Pension & Benefits Institute Fundamentals Series, April 2005
- "Emerging Trends for Pension Plans" – Morneau Sobeco Emerging Trends Seminar, May 2005
- "Pension Trends and Predictions"- Morneau Sobeco Trends and Projections Seminar, September 2005
- "Essential Skills for Pension Committee Members" – Federated Press, Course Leader, February 2006
- "Pension Governance – Performing a Governance Audit" – Federated Press Pension Governance Conference, with Bethune Whiston, Morneau Shepell, March 2006
- "Essential Skills for Pension Committee Members" – Federated Press, Course Leader, June 2006
- "Pension Trends and Predictions"- Morneau Sobeco Trends and Projections Seminar, September 2006
- "The Impossibility of Funding Mature Pension Plans" – Federated Press Pension Funding Conference, September 2006
- "Essential Skills for Pension Committee Members" – Federated Press, Course Leader, November 2006 and February 2007
- "Improving Pension Governance – Decisions, Decisions, Decisions" – Morneau Sobeco Roundtable, March 2007
- "Pension Trends and Predictions"- Morneau Sobeco Trends and Projections Seminar, September 2007
- "Governance Structures and the Role of Pension Committee Members" – Federated Press, Workshop Co-Leader, December 2007
- "Pension Governance and Delegation" – Canadian Institute Conference on Pension Law, Litigation and Governance, January 2008
- "What Does it Take to Establish a Successful Pension Committee?" – Federated Press, March 2008
- "Pension Trends and Predictions"- Morneau Sobeco Trends and Projections Seminar, September 2008
- "Governance Structures and the Role of Pension Committee Members" – Federated Press, Workshop Co-Leader, November 2008
- "Unlocking Pension Funds" – Association of Canadian Pension Management, a debate with Malcolm Hamilton in which I opposed the proposition that pension funds should be unlocked, November 2008
- "Pension Reform" – Morneau Sobeco conference, March 2009
- "Pension Governance – Performing a Governance Audit" – Federated Press Pension Governance Conference, with Tejash Modi, Morneau Shepell, June 2009

- "Pension Trends and Predictions"- Morneau Sobeco Trends and Projections Seminar, September 2009
- "Pension Governance – Performing a Governance Audit" – Federated Press Pension Governance Conference, with Tejash Modi, Morneau Shepell, June 2010
- "Pension Trends and Predictions"- Morneau Sobeco Trends and Projections Seminar, September 2010
- "Governance Structures and the Role of Pension Committee Members in a Period of Crisis" – Federated Press, Workshop Leader, November 2010
- "Updating Pension Practices in Light of Recent Judicial Decisions" – Canadian Institute conference, with Hugh Wright, McInnis Cooper, January 2011
- "Designing and Implementing a Pension Governance System" – Federated Press, Workshop Leader, June 2012
- "Essential Skills for Pension Committee Members – Retirement Income Needs" – Federated Press, October 2012, October 2013, October 2014

Other Professional Activities

- Wrote and presented brief to Ontario Finance Committee regarding reform of pension legislation, 1986
- Co-ordinated industry seminar and preparation of report on behalf of Ontario consulting organizations to Pension Commission of Ontario and Ministry of Finance regarding pension reform proposals, 1989
- Initiated the founding of the Pension Review Council – a group of representatives of major consulting and legal firms to review issues with legislation and provide a forum for liaison with the pension regulators
- Participated in seminars and assisted in analysing and commenting on proposed changes to Income Tax Act, as part of Pension Review Council, 1989 – 1992
- Director, Multi-Employer Benefits Council of Canada, 1992-1993
- Humber College, Centre for Employee Benefits, Faculty
  - Certified Employee Benefit Certificate course, 1983 – 1990
  - Pension Plan Administration Certificate, Courses 2 and 3, 1990 – present
    - "Understanding Actuarial Reports", 1990 – 1993
    - "Pension Plan Cash Flows", 1994 – 1998
    - "Financial Calculations – Pension Administration Basics", 2006 – present
    - "Dollars and Cents of Pensions – Perspectives on Investing", 2002 – 2006
    - "Pension Plan Governance", 2007 – present
    - "Pension Benefits Legislation", 2005 – present
    - "Income Tax Act and Pensions", 2005 – present
- CBC Marketplace, "Easy Loans: Uneasy Money" where I provided information about the interest rate and total charges for various high-rate loans, 27 February 2015

Community Service

- Heart & Stroke Foundation of Ontario, Hamilton-Wentworth Chapter
  - Member, Board of Directors and Chair, Corporate Committee, 1992 – 1998
  - President, 1995-1997
- Heart & Stroke Foundation of Ontario
  - Provincial Development Committee, 1997 – 1998
- Rotary Club of Hamilton, 1993 – 1998
  - Member, Easter Seals Committee, 1993 – 1997
  - Weekly Reporter for newsletter, 1995 – 1998
  - Sergeant-at-Arms and Director, 1996 – 1997
- Ancaster Community Food Drive
  - Co-chair, 1994 – 1998
- Rosedale Presbyterian Church, Toronto
  - Elder, 1985 – 1990
  - Sunday School Teacher, 1982 – 1984
  - Co-chair, Vietnamese Refugee Sponsorship Committee, 1979-1981
- St. Andrew's Presbyterian Church, Ancaster
  - Elder, 1991 – 1998
  - Board of Managers, 1991-1993
  - Sunday School Teacher, 1993 – 1998
- Presbyterian Church in Canada, Pension Board
  - Member, 1986 – 1991
- Presbyterian Church in Canada, Pension Task Force, 1988 – 1990
  - Review plan and design new benefit structure
- Presbyterian Church in Canada, Pension Task Force, 1994 – 1996
  - Review funding of plan and determine alternative sources of funds
- Neighbour to Neighbour Centre, Hamilton
  - Board of Directors, 1997 – 1998
- Chandos Lake Property Owners Association
  - Board of Directors and Treasurer, 1996 – 2003
- Rotary Club of Whitby Sunrise, Whitby, 2000 – present
  - Board of Directors, 2002 – 2006 and 2009 - 2012

- Newsletter editor, 2001 – 2003
- President elect, 2003 – 2004
- President, 2004 – 2005
- By-law review subcommittee, 2008 and 2013
- Treasurer, 2009 – 2012

- Rotary International District 7070 Inc. (Toronto to Belleville)
  - District Treasurer, 2012 – 2015

This is Exhibit "B" mentioned and referred to in the affidavit of PETER GORHAM
Sworn before me this 8TH day of APRIL A.D. 2015
A Commissioner for taking affidavits

MORNEAU SHEPELL

ACTUARIAL REPORT ASSESSING THE FINANCIAL SUFFICIENCY OF THE 1986-1990 HEPATITIS C TRUST FUND AS AT 31 DECEMBER 2013

Prepared 8 April 2015

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1. PURPOSE

1. This report has been prepared at the request of Health Canada and the Department of Justice of the Government of Canada. Morneau Shepell was retained to perform an actuarial valuation of the 1986-1990 Hepatitis C Compensation Fund (the "**Fund**") as of 31 December 2013 in order to:

   a. provide an evaluation of the financial position of the Fund as of 31 December 2013 for support of the 2013 Sufficiency Hearings;

   b. provide an analysis of actual to expected experience for the three years from 31 December 2010 to 31 December 2013;

   c. provide an independent review of the 2013 actuarial report prepared by Eckler for the Joint Committee (the "**Joint Committee**") established under section 9.01 of the January 1, 1986 to July 1, 1990 Hepatitis C Settlement Agreement (the "**Plan**");

   d. provide an evaluation of the sensitivity of the valuation results to changes in the key actuarial assumptions; and

   e. provide information to the federal government to assist them in reviewing their position with respect to the Fund.

2. The intended users of this report are Health Canada, the Department of Justice of the Government of Canada, the Joint Committee and the courts having jurisdiction over the Plan and Fund. The law may require this report to be provided to other parties who are not intended users. The report may not be provided to anyone who is not an intended user except as may be required by law. The findings herein may not be used or relied upon by any party other than an intended user without the prior written consent of Morneau Shepell.

2. EXECUTIVE SUMMARY

BACKGROUND

3. During the period 1986 to 1990, a number of people were infected with Hepatitis C from blood transfusions. A trust fund was established to provide compensation to people infected during this time period.

4. A summary of the Plan benefits and the amounts payable is contained in Appendix A. Appendix E provides a glossary of terms used in this report.

5. The Settlement Agreement distinguishes between haemophiliacs and non-haemophiliacs. In this report, the non-haemophiliac claimants are referred to as "**transfused**" claimants.

6. This report provides an independent review of the financial position of the Fund as well as a review of the Eckler Report.

7. For this valuation, we were instructed to work cooperatively with Eckler to select the actuarial methods and assumptions jointly. The intent is to use the same assumptions in our respective valuations provided that did not result in compromising our professional integrity or result in using assumptions that we believed were inappropriate for the purpose. If we were unable to agree with respect to an assumption, the reasons therefor and financial effect was to be disclosed.

8. We cooperated with the analysis of the data and shared our respective findings. Both actuaries accept all of the assumptions used in this valuation – there are no differences.

9. We have shared our respective results and in our opinion, the differences are immaterial and the results should be considered as essentially the same. For this reason, unlike our prior reports, we do not show the Eckler results for comparative purposes.

BEST ESTIMATES AND PROVISION FOR ADVERSE DEVIATIONS

10. In this report, we show results on a best estimate basis as well as results including a provision for adverse deviations.

11. The best estimate results are based on actuarial assumptions that in our opinion represent the most likely expectation for the future. This means that there is approximately a 50% chance that future experience will be better than the assumption and a 50% chance that it will be worse. In this way, the resulting best estimate actuarial liabilities represent the amount of assets required so there is approximately a 50% chance of having too much money and a 50% chance of having too little money.

12. It is neither appropriate nor prudent to assess the sufficiency of the Fund using best estimate assumptions. Since there is an agreement that no additional monies will be provided to the Fund

by the governments, it is prudent to assess the financial sufficiency of the Fund utilizing a basis that has a greater chance than 50% of having sufficient assets to pay all future benefits. This is done through the use of conservatism in the actuarial assumptions. Conservatism is introduced through the use of assumptions that represent the best estimate for the future *together with* a provision for adverse deviations. While it is possible that actual experience may deviate from our best estimate assumptions in a positive way (thereby reducing the Plan liabilities), this should not be recognized until such time as a positive deviation has occurred.

13. The use of best estimate results together with results including provision for adverse deviations permits the user of this report to assess the degree of conservatism inherent in the results. Ultimately, it is an issue of individual judgement as to the amount and degree of provision for adverse deviations that is prudent to recognize, having regard to the interest of all parties to the Settlement Agreement.

14. We have also added an additional buffer for catastrophic events. This is to provide an allowance we believe the Fund may require to withstand any adverse events that have a very low probability of occurring but that are still reasonably possible. One could liken that to recognising events that might occur once a century but ignoring events that are less likely.

HEPATITIS C CLAIMANT COHORT

15. The last date for filing claims for benefits from the Fund was 1 July 2010, (subject to some exceptions). As of 31 December 2013, there were still 299 transfused and haemophiliac claims in process of adjudication. There will also likely be a number of additional late claims that are permitted under the terms of CAP1 and CAP2. Regardless, we believe that most of the claimant cohort is now known. Compared with past years, there is much less uncertainty about the characteristics of those yet to claim.

16. Table 16 shows the number of claimants (both known and unknown) we have assumed for this report.

Table 16 - Cohort Size – Known and Unknown Claimants

Description	Known Claimants	Unknown Claimants	Total
Transfused Cohort			
• alive claimants	2,821	177	2,998
• claimants who died after 1998	919	52	971
• claimants who died before 1999	184	25	209
Total Transfused Cohort	3,924	254	4,178
Haemophiliac Cohort			
• alive claimants	877	14	891
• claimants who died after 1998	181	9	190
• claimants who died before 1999	301	3	304
Total Haemophiliac Cohort	1,359	26	1,385
Total of all Claimants	5,283	280	5,563

DISEASE PROGRESSION

17. The amount of data about the known claimants was sufficient for the MMWG to base their rates of disease progression in the 2013 MMWG Report on this Plan's claimants. Previously, they combined the claimants' data with results from international studies.

18. The 2010 MMWG Report discussed the trend for changes to the progression of the disease in the future. People progress through Hepatitis C at different rates. They can be divided into three groups: rapid, intermediate and slow progressors. As the rapid progressors die, the remaining claimants will be made up more and more of the intermediate and slow progressors. We believe that this will likely be manifested by a gradual reduction in the disease progression rates and a lengthening in the observed time to progress from disease level to level. That effect will be recognised in future sufficiency reviews. We have not attempted to quantify it within this review.

19. A major change in the expected future of HCV is the recent and expected introduction of new drugs for treatment. These drugs greatly increase the efficacy of treatment and are considered to be easier to take. The drugs come at a high cost with most treatments estimated to cost between $60,000 and $80,000 for a 12-week program. We expect that the bulk of that cost will be covered by the Fund as provincial drug programs are assumed to not add the drugs to their formularies for some time.

20. This increased drug cost is expected to accelerate the cash flows of the Fund for compensation and result in a significant reduction in future compensation payments as many claimants are assumed to clear the virus.

21. Following the finalisation of our valuation results we became aware that Abbvie received Health Canada approval on 23 December 2014 for Holkira Pak, a 3D-regimen drug. We understand the price of the drug is about $56,000 for a 12-week treatment, plus the cost of ribavirin, if used. (We

have not been able to determine whether that price for Holkira Pak is wholesale or retail). For the valuation, we assumed that the price would be similar to Harvoni, a sofosbuvir doublet drug, which we were informed cost about $85,000 based on an average of 13.2-weeks for treatment.

22. The price of Holkira Pak may lead to a reduction in the price of Harvoni and possibly other HCV drugs.

23. It may be that the cost of drugs will be less than assumed in the valuation and that will result in experience gains. We have not reflected this possibility in this report. If the prices of the drugs are lower than assumed, the gains will be reflected in the next sufficiency review.

Excess HCV Mortality

24. There are a large number of deaths occurring at levels 2 to 5 that are being approved as having occurred as a result of HCV. There is no provision in the MMWG model or in the MMWG disease progression rates for any death as a result of HCV to occur at a level other than level 6. These HCV related deaths at levels 2 to 5 are consistent with the expected deaths under the MMWG model, but they are considered by the MMWG model to be from non-HCV related causes. We refer to these deaths as due to "excess HCV mortality".

25. This excess HCV mortality arises from the difference in the medical and legal definitions of "as a result of HCV". The medical definition used by the MMWG makes little allowance for HCV interacting with another disease and accelerating the time of death. For purposes of the MMWG research, we agree that the use of the medical definition is likely the most appropriate. For purposes of the actuarial valuation for sufficiency purposes, the excess HCV mortality should be recognised. This was discussed in a conference call involving the MMWG, Eckler and Morneau Shepell and we all agreed that the actuaries would recognise the excess HCV mortality.

FINANCIAL RESULTS

26. Table 26 presents a summary of the overall financial results of the Plan.

Table 26 - Summary of Financial Results (in '000s)

	Best Estimate		Provision for Adverse Deviations	
	2013	**2010**	**2013**	**2010**
Assets	$ 1,190,199	$ 1,177,262	$ 1,190,199	$ 1,177,262
Liabilities				
▪ Transfused	387,114	412,012	491,612	528,404
▪ Haemophiliacs	223,969	242,240	264,471	284,150
▪ HIV Program	950	1,100	970	1,100
▪ Fees & Expenses	53,455	34,091	55,552	34,658
Total Plan Liabilities	665,488	689,443	812,605	848,312
Fund Surplus (Deficit)	**$524,711**	**$487,819**	**$377,594**	**$328,950**
Additional buffer against catastrophic events			121,000	-
Excess Assets			**$256,594**	**$328,950**

27. Detailed financial results by cohort and benefit are presented in Section 8. The assets are summarized in Section 7.

28. The provision for adverse deviations produces a total liability about 22% greater than the best estimate liability. The additional buffer against catastrophic events adds 18% of the best estimate liability for a total buffer of about 40% of the best estimate liability.

29. Additional information about the provision for adverse deviations, the change in the surplus amount from 2010 to 2013 and the sensitivity of the results to assumption changes are in Sections 8 and 9.

30. In my opinion, the Fund is sufficient and there are excess assets of $256.6 million at 31 December 2013.

PROVINCIAL/TERRITORIAL CONTRIBUTION OBLIGATION

31. The provinces and territories are given a choice under the Settlement Agreement to either contribute on a pay-as-you-go basis or to prefund some or their entire contribution obligation. As of 31 December 2013, there was a total remaining contribution of $162 million of which $14,000 had been prefunded. The remaining provincial/territorial contributions are increased annually for interest based on the return of 90-day Treasury Bills.

32. We have projected the future provincial/territorial contribution requirements for each year based on the cash flows under both the best estimate and the provision for adverse deviations assumptions.

33. Using the best estimate assumptions for determining the amount and timing of future benefits, the provincial/territorial contribution obligation is expected to expire in 2024. After that time, there will be no additional funds payable by the provinces and territories.

34. Using the provision for adverse deviations assumptions, the provincial/territorial contribution obligation is expected to expire in 2021.

CERTIFICATION

35. I hereby certify that:

    a. In my opinion, the Fund is sufficient;

    b. In my opinion, the data used is sufficient and reliable for the purposes of the report;

    c. In my opinion, the actuarial methods are appropriate for the purpose of this report;

    d. In my opinion, the assumptions used are, in aggregate, appropriate for the purposes of the work;

    e. The calculations were prepared in accordance with the Canadian Institute of Actuaries' Standards of Practice;

    f. This report has been prepared and my opinions given in accordance with accepted actuarial practice in Canada;

    g. There are no subsequent events other than those discussed in this report that I am aware of that would have an impact on the results presented herein; and

    h. This report conforms to my duty to:

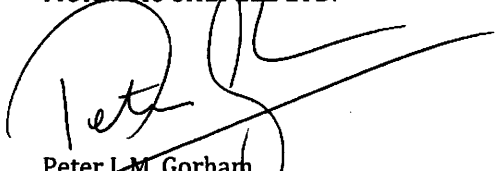
        (i) provide opinion evidence that is fair, objective and without advocacy for either party and related only to matters that are within my area of expertise;

        (ii) if called upon to give oral or written testimony, I will give that testimony in a fair, objective manner and without advocacy for either party; and

        (iii) assist the court and provide such additional assistance as the court may reasonably require to determine the matter at issue.

36. I am available to answer any questions or to provide additional information regarding any aspect of this report.

Respectfully submitted,
MORNEAU SHEPELL LTD.



Peter J. M. Gorham,
Fellow, Canadian Institute of Actuaries
Fellow, Society of Actuaries

This report has been peer reviewed by Scott Simpson, F.C.I.A., F.S.A.

3. BACKGROUND

37. During the period 1996 to 1998, a number of class action lawsuits were brought forward against the federal, provincial and territorial governments on behalf of people who were infected with Hepatitis C from blood transfusions received between 1 January 1986 and 1 July 1990. A Settlement Agreement was reached as of 15 June 1999 that provided for the establishment of a trust fund to pay benefits to the affected class. This Settlement Agreement specifies the persons eligible to receive benefits, the amount of benefits payable, the funding of the benefits by the federal, provincial and territorial governments and the investment of Plan assets.

38. Benefits under the Plan are dependent on the progression of a claimant through the various levels of the disease. Benefits are also dependent on:

    - whether the person is haemophiliac (non-haemophiliacs are referred to as "transfused"); and
    - whether the person died prior to 1999 or was alive on 1 January 1999.

39. To be eligible for compensation from the Fund, claimants must show clinical evidence of infection from Hepatitis C; must have received blood products during the period 1 January 1986 to 1 July 1990 where such blood product can be shown to have contained the Hepatitis C virus (through a trace-back program); and, with the exception of haemophiliacs, must be able to demonstrate that prior infection is not likely to have occurred. Claims must be filed with the administrator of the Plan prior to 1 July 2010.

40. A summary of the Plan benefits and the amounts payable for the various levels of the disease is contained in Appendix A. Appendix E is a glossary of terms used in this report.

41. In this report, the term "**level**" is used to refer to the disease levels for which compensation is paid under the Plan. The term "**stage**" is used to refer to the disease stages as modelled in the MMWG Report (see Appendix E). There is a comparison of the various levels and stages contained in Section 11 - Actuarial Assumptions.

42. The Settlement Agreement distinguishes between haemophiliacs and non-haemophiliacs. In this report, the non-haemophiliac claimants are referred to as "**transfused**" claimants.

43. Under the terms of the Plan, an actuarial valuation of the benefits is to be produced at least every three years to assist the courts with their review of the sufficiency of the Fund. The most recent actuarial valuations for that purpose was prepared by Eckler as of 31 December 2010 (dated July 2011) and by Morneau Shepell as of 31 December 2010 (dated 4 April 2012).

44. At the request of Health Canada, Morneau Shepell undertook an independent review of the Plan as of 31 December 2004, 31 December 2007 and as of 31 December 2010. Health Canada has requested Morneau Shepell to again perform an independent review of the Plan as of 31 December 2013 and prepare this report detailing the results.

4. DOCUMENTS PROVIDED

45. We were provided with the following data and documents that we have used in the preparation of this report

a. A letter dated 6 February 2014 from Kevin O'Connell of Crawford Class Action Settlements together with a document titled "Worksheet References" and disk containing class member data, (including applicants whose claims have been denied or remain pending a decision) as of 31 December 2013 that I am informed was prepared by the Administrator at the request of the Joint Committee;

b. "Estimating the Prognosis of Canadians Infected With the Hepatitis C Virus Through the Blood Supply, 1986-1990 - Fifth Revision of Hepatitis C Prognostic Model Based on the Post-Transfusion Hepatitis C Compensation Claimant Cohort", dated September 2014 by Wendong Chen, MD PhD, Qilong Yi MD MSc PhD, William Wong, PhD and Murray Krahn MD MSc FRCPC (the "**MMWG Report**");

c. Two Court Approved Protocols – the Recent HCV Diagnosis Exception ("**CAP1**") and Issuance of Initial Claims Packages ("**CAP2**");

d. Copies of the Annual Report of the Joint Committee for years 12, 13 and 14 (covering operations for 2011 to 2013), which included among other items, the audited financial statements and the Investment Summary Report of Eckler for each of the three years;

e. Application to the Supreme Court of British Columbia for approval of the Year 14 Annual Report of the Joint Committee.

f. The decision of the Ontario Superior Court of Justice in the matter of Dianna Louise Parsons et al. v. The Canadian Red Cross Society et al. dated 22 October 1999, together with the 1986-1990 Hepatitis C Settlement Agreement and Funding Agreement made as of 15 June 1999 containing Schedules A through D entitled the Transfused HCV Plan, the Hemophiliac HCV Plan, the Federal Provincial Territorial Assistance Program for Secondarily-Infected Individuals, and the Funding Agreement (the "**Settlement Agreement**" or "**Plan**");

g. A data file containing class member data as of 30 August 2013 that was provided to the Medical Model Working Group (the "**MMWG**") together with a file containing the results of a survey of some of the claimants regarding prior treatments and clearing the virus;

h. Numerous email correspondence between some or all of the Joint Committee, Department of Justice, Crawford Class Action Settlements, the MMWG, Eckler and Morneau Shepell in which queries were raised, answers provided and supplemental information provided, all of which was carried out within the spirit of cooperation between Eckler and Morneau Shepell;

i. Drug Treatments for Hepatitis C, a summary of treatments and publicly available costs prepared by Robert Gervais, MD, Public Health Medical Advisor, Public Health Agency of Canada; and

j. An email from Amanda Larocque on Behalf of Natasha Leclerc of Health Canada that provided information about various treatments and drugs approved for Hepatitis C and including a spreadsheet prepared by the Bureau of Gastroenterology of Health Canada providing details of various approved drugs and recommended treatment protocols.

46. In addition to the above documents and data, we obtained the following documents and information from the Internet that we have used in the preparation of this report:

a. "Patient Time Costs and Out-of-pocket Costs in Hepatitis C", Carole A. Federico, Priscilla C. Hsu, Mel Krajden, Eric M. Yoshida, Karen E. Bremner, Alan A. Weiss, Frank H. Anderson, Murray D. Krahn; Liver International. 2012;32(5):815-825 (onlinelibrary.wiley.com/doi/10.1111/j.1478-3231.2011.02722.x/abstract);

b. "Distribution of hepatitis C virus genotypes in Canada: Results from the LCDC Sentinel Health Unit Surveillance System", RK Chaudhary, PhD, M Tepper, MD, S Eisaadany, and Paul R Gully, MD; Can J Infect Dis. 1999 Jan-Feb; 10(1): 53–56. (www.ncbi.nlm.nih.gov/pmc/articles/PMC3250747/);

c. "Genetic Variation and HCV Genotyping", Hepatitis Central, (www.hepatitiscentral.com/hcv/genotype/genotyping.html);

d. Three other websites were used to obtain drug cost information and information about drugs being removed from the market or pulled from the approval process:

(i) www.hepatitisc.uw.edu/page/treatment/drugs/sofosbuvir-drug

(ii) www.egyreg.com/2015/Sofosbuvir_cost.html

(iii) www.projectinform.org/uncategorized/breaking-news-hcv-drug-faldaprevir-pulled-from-submission-for-fda-approval/; and

e. Weekly Financial Statistics, Bank of Canada, 28 February 2014;

5. DISEASE PROGRESSION

In This Section....

We provide a brief summary of:

- the MMWG medical model and the various stages of Hepatitis C
- Changes in the model from the 2010 version
- transition rates between stages
- treatment effect on transition rates
- HIV co-infection effect on progression of Hepatitis C
- develop an assumption for recognition of excess HCV mortality

47. The following is a high level summary of Hepatitis C disease progression as it has a bearing on this valuation, based on our understanding of the MMWG Report. We have utilized these findings in this valuation.

48. A person infected with Hepatitis C will usually show signs of the infection through blood tests. A number of people infected recover, possibly without knowing that they have been infected, but will still have signs of the disease in their blood. This is referred to in this report as RNA negative, or as F0(RNA-). We understand that there may be a remote chance of the disease redeveloping in the future. However, both the projections in the MMWG report and the calculations used in this report ignore that possibility. A person at stage F0(RNA-) is considered to be recovered.

49. The rate at which Hepatitis C develops varies from person to person. It can take many years before some people will notice that they are sick and discover they have the disease, whereas others will progress through the various stages much more quickly. The progression of the disease was assumed to be similar in haemophiliacs and non-haemophiliacs. However, due to the younger age and higher co-infection with HIV of haemophiliacs, there is a greater chance of developing cirrhosis and of death from Hepatitis C among haemophiliacs than transfused claimants.

50. The stages that are modelled in the MMWG report differ from the levels that are used for compensation under the Plan. Based upon advice provided by the authors of the MMWG report, Eckler determined an approximate relationship between the levels under the Plan and stages as modelled in the MMWG report. We have utilized the same assumed equivalency for purposes of this report. We understand that non-bridging fibrosis is actually identified in patients somewhere between stages F1 and F2. Both MMWG and Eckler assumed non-bridging fibrosis occurs at clinical stage F1, earlier than it would occur for most patients. We have made the same assumption.

51. It may be that this linking of Level 3 (non-bridging fibrosis) with stage F1 introduces a level of conservatism to the results. Such conservatism is present in all of our results, including those identified as "best estimate". We have not attempted to adjust for this since the linkage between level 3 and stage F1 appears to be consistent with the way the claimant data is presented and the results presented in the MMWG Report.

52. The stages modelled in the MMWG report and the levels recognized under the Plan are:

Table 52 – Hepatitis C Disease Stages and Levels

MMWG Stage	MMWG Stage Description	Compensation Plan Levels	Compensation Plan Description
F0(RNA-)	Fibrosis Stage 0 – RNA negative	1	Claimants who have cleared the virus
SVC	Spontaneous Viral Clearance	1	
SVR	Sustained Viral Response	*	
F0(RNA+)	Fibrosis Stage 0 – RNA positive	2	PCR test positive
F1	Fibrosis Stage 1	3	Non-Bridging Fibrosis
F2	Fibrosis Stage 2		
F3	Fibrosis Stage 3	4	Bridging Fibrosis
F4	Cirrhosis	5	Cirrhosis
HCC	Hepatocellular Cancer	6	Cancer
Decomp	Decompensated cirrhosis		Liver decompensation
Transplant	Liver Transplant		Liver Transplant
Death	Liver related death		Death

* SVR is the state of having cleared the virus after receiving treatment. The claimant's level does not change, but they remain virus free and will not progress in the disease, except at level 5, cirrhosis, where progression occurs at half the regular rate. Any damage done by the virus is not reversed.

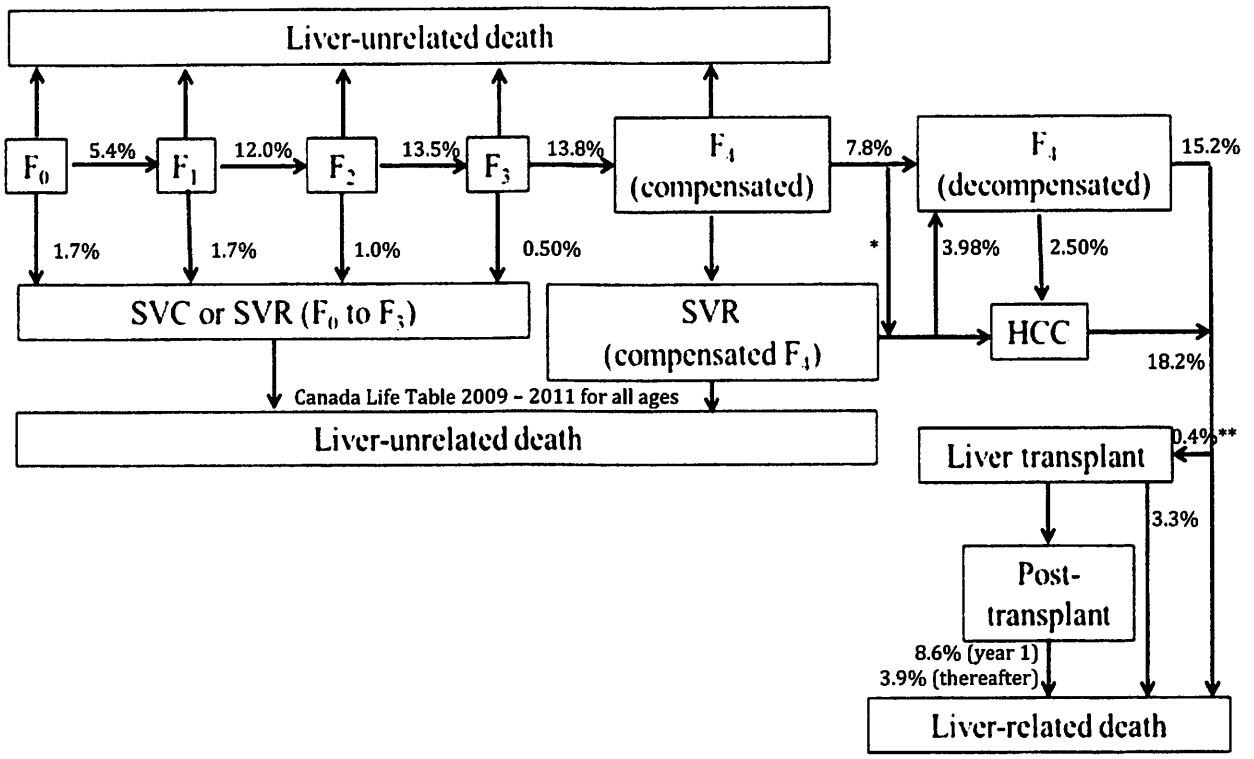
53. In the MMWG model, the disease was modelled recognizing a maximum progression of one stage in a year. Progression to subsequent stages would occur in sequence except

    a. one can transition from any of stages F1 to F3 to SVC or SVR and from F4 to SVR;

    b. one can transition from any of the stages F1 to F4 to HCC.

54. Chart 54 shows the possible sequences of disease progression as recognized and modelled in the report. It should be noted that there may be other patterns to the disease progression, including regression to an earlier stage. However, they were considered to have such a low probability as to be immaterial to the results. The percentages shown on the chart are the MMWG baseline probabilities for a transfused person of transitioning from one disease stage to another over the course of a year. As discussed below, transition probabilities for HIV co-infected people are higher, and for those who have been successfully treated (SVR) or are status SVC (Spontaneous Viral Clearance) the transition probabilities are lower.

Chart 54 – Disease Progression as Modeled in the MMWG Report



* Annual transition rates to HCC differ by stage:

F0	0.01%
F1	0.01%
F2	0.01%
F3	0.10%
F4	2.50%
F4 (SVR)	1.26%
Decomp	2.50%

** The 0.4% rate of transition from Decompensation to Transplant and from HCC to transplant is in addition to the rate of transition shown above in the chart (15.2% and 18.2%) for liver related death.

This chart is taken from the MMWG Report. Each box represents a health state for the individuals infected due to blood transfusion in Canada between 1986 and 1990. Each solid arrow represents possible transitions between health states that may occur each year. The percentages have been added to the chart by us to indicate the annual baseline probability of transitioning between disease stages.

MORTALITY FROM NON-LIVER RELATED CAUSES

55. During the time that a person has Hepatitis C, they continue to be subject to death from causes other than Hepatitis C. This is no different from others who do not have Hepatitis C. Both the MMWG report and this report recognize that possibility in the projections done. A claimant who dies from non-liver related causes remains entitled to any payments made or due based on the stage reached prior to death, but is not entitled to any additional payments as a result of death.

56. For the 2013 medical model, the MMWG applied mortality rates derived from the claimant cohort combined with mortality rates from the Canada Life Tables 2009-2011. In our discussions with the actuaries from Eckler, we agreed to utilise the Canada Life Tables 2009-2011 for all non-liver related mortality. The impact of this change from the MMWG model assumption on the projections and the financial results is immaterial.

EXCESS MORTALITY RELATED TO THE CONDITION REQUIRING BLOOD TRANSFUSION

57. Many persons entitled to compensation under the Plan received a blood transfusion during the period 1986 to 1990. The 2010 MMWG report discussed the possible existence of excess mortality in relation to average population mortality as a result of the condition that gave rise to the need for the transfusion. It was concluded that any such excess mortality would reduce to nothing or an immaterial level during the ten years following the transfusion. Since the most recent blood transfusion that could be related to the transmission of Hepatitis C for infected claimants under this Plan occurred more than 10 years ago, the possibility of excess mortality factors unrelated to Hepatitis C is ignored.

58. It is possible that a claimant under the Plan might have received a subsequent blood transfusion and may be subject to excess mortality as a result of the condition that gave rise to that transfusion. This possibility has been ignored since the mortality table used for this report reflects such issues by virtue of being a Canadian population mortality table.

TRANSITION PROBABILITIES

59. The progress of a claimant through the various disease stages is modelled using probabilities. The transition probabilities used in our calculations are taken from the MMWG Report and are the same as were used in the MMWG Report. These represent the probability of transition to another disease stage during the course of one year.

60. In 2010 and prior MMWG Reports, the MMWG established the baseline transition rates as a blend of the experience of the claimant cohort and results of published studies from around the world. We considered in 2010 that the baseline rates likely included a provision for adverse deviations.

We utilised the baseline 2010 rates as the transition rates for the liabilities including a provision for adverse deviations. For the best estimate liabilities, we replaced the baseline transition rates between stages F0 and F4 with rates developed by the MMWG from the claimant cohort.

61. With the 2013 MMWG Report, the baseline transition rates were determined based only on the experience of the claimant cohort. We consider these 2013 rates as the best estimate transitions probabilities.

62. For purposes of the valuation model, a claimant who experiences SVC or SVR is transitioned to status SVC but retains their prior disease level. The process of SVR and SVC does not undo any damage that had previously occurred and it is therefore appropriate to recognise that a claimant at SVC (F4) may still have a disability and file a claim for Loss of Income or for Loss of Services in the Home. A claimant at SVC(F1) is much less likely to have a future disability and so will likely never have a claim for Loss of Income or for Loss of Services in the Home.

63. There are two ways that a person can experience SVC or SVR. A small percentage of claimants will do so spontaneously without treatment each year. Most claimants will do so as a result of being successfully treated with one of the HCV drug regimens. The prior versions of the model did not recognise SVC and SVR other than as a result of treatment, as it was considered to be immaterial. The 2013 model has determined transition rates for SVC and SVR occurring spontaneously as well as by treatment.

64. A claimant who experiences SVC or SVR spontaneously is considered as cured and is assumed to not advance further in the disease.

65. The treatment of SVC and SVR has changed from the 2010 and prior valuations. A claimant who is successfully treated at stages F0 to F3 is considered as cured and has a zero probability of transitioning to a higher disease stage. While they will not advance in the disease, they may still experience other liver related issues, such as disability or excess HCV mortality. A claimant who is successfully treated at stage F4 has the transition rates to Decompensation reduced to half of the baseline transition rate. In prior valuations, claimants who had SVC or SVR were considered as having a reduced probability of advancing in the disease, with the probability of advancing equal to 10% of the probability that applied to a person who had not been successfully treated.

66. The basic transition probabilities are from Table 12 of the MMWG report. The baseline probabilities represent the mean probabilities and are the values used for the both the best estimate and provision for adverse deviations liabilities in this report. The transition probabilities are adjusted for the effects of successful treatment and for the effects of HIV on fibrosis progression in the same manner as was done in the MMWG Report. The basic transition probabilities are:

Table 66 - Transition Rates for Singly Infected – 2013 Model with comparatives from 2010 and 2007

From Stage	To Stage	Transition Rates 2007	Transition Rates Best Estimate 2010	Transition Rates 2013
F0(RNA-)	F1	0.0%	0.0%	0.0%
SVC*	F1	n/a	n/a	0.0%
F0(RNA+)	F0(RNA-)	2.0%	1.7%	1.7%
F1	SVC	n/a	n/a	1.7%
F2	SVC	n/a	n/a	1.0%
F3	SVC	n/a	n/a	0.5%
F0(RNA+)	F1	6.6%	2.9%	5.4%
F1	F2	10.4%	11.8%	12.0%
F2	F3	16.2%	13.7%	13.5%
F3	F4	18.4%	10.3%	13.8%
F4	Decompensation	5.5%	6.5%	7.8%
Decompensation	Transplant	3.3%	3.3%	0.4%
F1	HCC	0.01%	0.01%	0.01%
F2	HCC	0.01%	0.01%	0.01%
F3	HCC	0.1%	0.1%	0.1%
F4	HCC	3.1%	3.3%	2.5%
Decompensation	HCC	n/a	n/a	2.5%
HCC	Transplant	-	10.0%	0.4%

* *SVC is considered to include SVR for purposes of this table. A claimant at SVC stages F1 to F3 is assumed to not advance to a higher disease stage. A claimant at SVC F4 is assumed to transition to Decompensated at half the baseline rate (50% of 7.8%) shown above.*

67. With the exception of non-HCV related mortality (Canada Life Tables, 2009-2011, that are based on age and gender), the transition rates do not vary by age, gender or duration of infection.

68. The best estimate transition rates for 2013 have generally increased from those used in 2010 with the exception of F2 to F3, and the transitions to Transplant and F4 to HCC. The only changes that are significant are from F0(RNA+) to F1 which almost doubled and transitions to Transplant which are now almost negligible.

Effect of time on fibrosis progression

69. The 2010 MMWG Report states: "Another concern ... is related to the assumption that HCV patients are homogenous and have similar fibrosis progression rates. Even within individuals, progression rates may vary as a function of fibrosis stage and age. Variation across individuals has also been convincingly demonstrated. Poynard et al., for example, suggests that there are at

least three populations in terms of disease progression: rapid, intermediate and slow progressors." (MMWG 2010 Report, page 26)

70. "As the 'rapid progressors' depart, the mean rate for progression for the residual cohort will fall." (MMWG 2010 Report, page 27)

71. "If transition rates fall over time, as one would expect with the changing composition of fibrosis health states (fast progressors depart more quickly leaving more slow progressors over time), the model as currently specified may overstate progression rates in the very long term." (MMWG 2010 Report, page 27)

72. It has been on average about 22 years since the class contracted HCV. We cannot determine from the MMWG Report what percentage of the rapid progressors would be expected to have reached level 6 or died, so it is not possible to estimate the effect of a possible decrease in transition rates for the future.

73. The recent introduction of new drugs for treating HCV is expected to have a significant effect on the future of the disease, with a significant number of claimants expected to be cured. With fewer claimants remaining with HCV and subject to the full transition effects, future changes in transition rates are likely to have much less of an impact on the fund's liabilities.

Effect of treatment on fibrosis progression

74. There are a number of treatments available for Hepatitis C that, if successful, will slow down or arrest progression of the disease. In the past three years, a number of new drugs have been approved that have significantly improved treatment prognosis to those previously available (boceprevir, ledipasvir and simeprevir)[1]. There are some additional drugs which may be approved by Health Canada (daclatasvir, dasabuvir, ombitasvir, paritaprevir and ritonavir) that are anticipated to further improve the outcome of treatments.

75. These new drugs are taken in a pill form rather than by injection, have less severe side-effects during treatment, have a shorter recommended duration for treatment and have a significantly higher efficacy rate than the previous treatments. The medical model has recognised these new drugs with a major change to the assumptions for future treatments.

76. Only one future treatment per claimant is assumed. A claimant who received treatment prior to 2014 that was not successful is eligible for a future treatment. However, a claimant who receives

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1 Two of the drugs referenced in the MMWG Report have since been withdrawn – faldeprevir was withdrawn from the approval process by the manufacturer and telaprevir was withdrawn from the market after having received approval.

treatment after 1 January 2014 and who is not cured is assumed to never receive another treatment.

77. The rate of treatment, type of drug assumed to be used and efficacy differ between those who have not received treatment in the past (treatment naïve) and those with past treatments (previously treated) as well as between those coinfected and not coinfected with HIV.

78. The rate of treatment, type of treatment received and efficacy of the different treatments varies based on certain characteristics of the claimants. Table 79 summarises the treatment probabilities for 2013. It is assumed that treatment is only considered for claimants at stages F0(RNA+) to F4. No treatment is given to claimants at F0(RNA-), Decompensation or HCC.

79. The treatment rates set out on the MMWG Report gave the percentage of claimants that are assumed to receive treatment at some time during the period 2014 to 2018. In our discussions with the actuaries from Eckler, we agreed to utilise annual rates of treatment as set out in Table 79. These rates when applied over the five years 2014 to 2018 inclusive result in the same percentage of claimants receiving treatment as set out in the 2013 MMWG Report.

Table 79 – Treatment Probabilities – 2013

	Treatment Naïve Without HIV	Treatment Naïve With HIV	Previously Treated Without HIV	Previously Treated With HIV
Treatment rate (per annum)	34.0%	19.3%	38.2%	17.5%
Percent of Treatments using :				
• PEG-IFN/RBV	0%	0%	0%	0%
• PEG-IFN/RBN based triple therapy	14.3%	8.3%	7.1%	8.3%
• Sofosbuvir-based doublet	50.0%	25%	35.7%	8.3%
• 3d regimen plus RBV	35.7%	66.7%	57.1%	83.4%
Treatment Efficacy				
• PEG-IFN/RBV	45.5%	37.1%	37.4%	30.5%
• PEG-IFN/RBN based triple therapy	70.0%	73.5%	53.8%	53.8%
• Sofosbuvir-based doublet	94.6%	80.2%	95.4%	80.9%
• 3d regimen plus RBV	96.2%	81.6%	96.3%	81.7%
Annual Cure Rate*	31.2%	15.6%	35.5%	13.9%
5-Year Cure Rate**	**80.2%**	**53.0%**	**84.5%**	**48.9%**

* The annual cure rate is the percent of all claimants in a future year who had not received a treatment since 1 January 2014 who are assumed to be cured through taking drug treatment. The medical model assumes that only one treatment regimen will be given per claimant on and after 1 January 2014, regardless of any treatments received prior to that.

** The 5-Year Cure rate is the percentage of all claimants who are assumed to be cured during the period 2014 to 2018.

80. A claimant who has been cured prior to disease stage F4 (level 5) remains at their attained disease level, but is assumed to not advance to a higher level. However, a claimant who is cured at stage F4 (cirrhosis, level 5), is assumed to advance to Decompensation and HCC at half the baseline rate[2].

81. Towards the end of our work, we became aware that the introduction of the new drug therapies might result in little, if any, ongoing use of the PEG-IFN/RBV based triple therapy. Instead, the more expensive Sofosbuvir-based doublet and the 3D regimen (with or without ribavirin) may be utilised. We are not in a position to determine an alternate assumption for the percent of treatments using each drug regimen and so we have utilised the same assumptions employed by the MMWG. In our opinion, the increased cost of the drugs will likely be somewhat more than offset by the reduction in future benefits due to the higher efficacy rates of the more expensive drugs. We therefore believe that the liabilities presented in this report are slightly overstated.

82. For the 2010 MMWG model, treatment was assumed to be considered for patients at four stages - F1 through F4. At each of those stages a percentage of the patients were assumed to receive treatment each year, and a percentage of those treated respond successfully to the treatment. A person could receive more than one regimen of treatment. Those percentages were:

Table 82 - Treatment Probabilities - 2010

Stage	Percentage of all patients receiving treatment in a year	Successful response among those treated	Successful response among all patients
F1	10.0%	49.0%	4.9%
F2	10.0%	49.0%	4.9%
F3	10.0%	49.0%	4.9%
F4	10.0%	31.0%	3.1%

83. For 2010, patients who did not receive treatment or where the treatment was not successful were eligible for treatment again each year and at subsequent stages where treatment is offered. The MMWG model provided for treatment to be given to a smaller percentage of patients after age 65. In Table 82, the 10% eligible for treatment was reduced to 3.3% at each of the stages for those over age 65.

84. A patient who was successfully treated was assumed to be subject to transition probabilities at approximately 10% of the baseline probabilities shown for 2010 in Table 66 above. This reduced probability applied at all stages up to liver decompensation for the patient's future life.

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[2] The formula used is: 1 - EXP(0.5 * LN(1 - baseline probability)).

Effect of HIV on fibrosis progression

85. HIV co-infection has an impact on the fibrosis progression rate of Hepatitis C. Haemophiliacs who are co-infected with HIV are subject to a differing set of transition probabilities from stages F0(RNA+) to decompensation. The baseline transition probabilities are increased by a factor of 2.122.[3] This is unchanged from the 2010 assumption.

Effect of HIV co-infection on population mortality

86. A number of claimants are infected with both Hepatitis C and HIV. Most of these are among the haemophiliac cohort, of which about 25% of the alive haemophiliac claimants and 38% of all haemophiliac claimants are coinfected with HIV. It is presumed under the Plan that the HIV infection was due to a blood transfusion. The presence of HIV is assumed to increase the non-liver death mortality rates by a factor of 6.24 (same as 2010). This is recognized in this report only for haemophiliacs.

87. Of the known transfused cohort, about ½ of one percent are co-infected with HIV. The population mortality table used in both the MMWG Report and this report is based on population statistics that include people with HIV/AIDS. As a result, we can assume that any excess mortality due to the presence of HIV among the transfused cohort is adequately included in the population mortality table used.

LIFE EXPECTANCY WITH HCV

88. Based on the disease progression rates, we can determine an average life expectancy for people with HCV. This life expectancy is based on time since infection and ignores normal mortality rates. If normal mortality rates were included, the actual life expectancy would be shorter – significantly shorter for those who contract HCV at older ages.

89. Chart 90 shows the average number of years a person could be expected to spend at each of the disease levels 2 to 6. Level 1 is not shown since it is considered to be recovered and the assumption is that no person at level 1 will progress further in the disease. Similarly, those who have SVC/SVR are not shown as they are cured and are expected to not advance in the disease (except at stage F4). This chart shows the expectancy based on the disease progression rates assumed in the 2004, 2007 and 2010 valuations compared with the rates assumed for this valuation.

90. There is a significant difference in the life expectancy at Level 2 between the 2010 class data and 2013. The 2013 MMWG Report states that the transition rates are based on the class data. The

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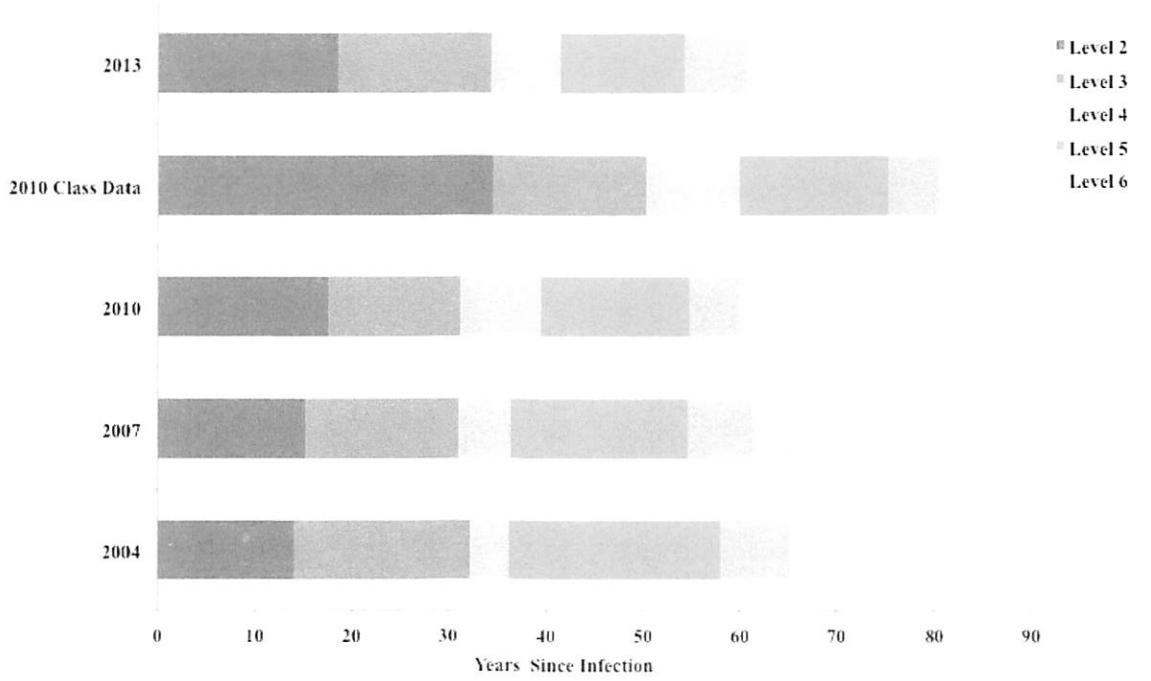
[3] The formula used is: 1 - EXP(2.122 * LN(1 - baseline probability)).

changes at the other levels are not as significant. There is no explanation provided in the MMWG Report for this difference.

Chart 90 – Change in HCV Life Expectancy 2004 – 2013



DATA ADJUSTMENTS APPLIED IN MMWG MODEL

91. The MMWG team apply adjustments to the observed data provided by the administrator. These adjustments appear to us to be due to the lag in the diagnosis of and reporting disease levels to the administrator.

92. Class members' actual disease levels are not the current level in all cases. A person may have advanced to a new level but is not yet aware of it due to not having visited their doctor or not having been diagnosed at the new level. A person may be aware of the change in level but not yet reported it to the Administrator. This would be particularly prevalent for changes from level 3 to level 4, since there is no additional compensation available at level 4 unless and until the person suffers a Loss of Income or Loss of Services in the home.

93. It appears to us quite reasonable that the MMWG would make such adjustments to the extent that they have information available to make these reclassifications. They discuss their adjustments on pages 17 to 21of the MMWG Report. Failing to make these adjustments might result in a lower probability of transition between stages than may actually exist.

94. While we are not in a position to assess these adjustments, we believe that they probably make sense for purposes of determining transition probabilities and therefore result in more realistic transition probabilities than would be obtained in the absence of such adjustments.

95. However, these adjustments are not appropriate for use in the disease distribution of the class members for the actuarial valuation. The purpose of the valuation is to determine the present value of future benefit payments. By adjusting the starting disease distribution, the timing and possibly the quantum of the future benefit payments would be affected. If we adjust the disease level to eliminate the lag between advancement in the disease level with the diagnosis and reporting to the administrator, we are advancing the timing of reporting a claim.

96. It is necessary to allocate claimants at level 3 between F1 and F2 as well as claimants at level 6 between decompensated, HCC and transplant. These adjustments are set out in paragraphs 143 to 144.

EXCESS DEATHS DUE TO HCV

97. The Plan provides benefits to be paid to claimants whose death was "caused by his or her infection with HCV". In reviewing the past experience of the Plan, we noticed that the incidence of HCV-related deaths differed markedly from what the MMWG model predicted.

98. In particular, the MMWG model provides for death caused by HCV only at level 6. The claims experience indicates that there are many infected persons who die at other levels, including level 2, where the death is classified as caused by HCV. We refer to these as excess HCV deaths or excess HCV mortality.

99. We understand that there is a significant difference in the interpretation of the phrase "caused by" between a doctor and the legal profession. We believe that the MMWG model provides for death as a result of HCV where HCV had a material contribution to death. The administration of the Plan appears to allow for deaths to be classified as a result of HCV where HCV had a less than material contribution to the death. As a result, there are many claimants who are approved for family and dependant benefits where the MMWG model would not recognize the death being as a result of HCV.

100. This should not be construed as a criticism or failing of the MMWG model. There is nothing to suggest that the MMWG model fails to provide properly for HCV related death, based on the medical profession's definition of the term. The real issue is that we need to reconcile the MMWG model with the administration process and make allowance in the valuation for this difference in classification of deaths.

101. Based on Plan experience to date, about 52% of all post 1999 transfused deaths and 72% of all post 1999 haemophiliac deaths have been classified as being caused by HCV.

102. Effective with the 2007 valuation, we analysed the past experience of the Plan and created a mortality assumption for excess HCV related deaths. That assumption was retained for the 2010 valuation. The experience of the past three years has remained consistent with our assumption.

103. The analysis and development of the assumption can be found in the 2010 Morneau Shepell Sufficiency Report and is not repeated here.

104. It should be noted that the analysis looked at differences between:

    a. transfused and haemophiliac claimants;

    b. those coinfected with HIV and those not coinfected; and

    c. different age groups.

    There was little statistically credible differences and so we determined it was appropriate to develop an assumption that does not vary between those classifications[4]. The only credible differences we found were between claimants at the various disease levels.

105. Since the MMWG model does not recognize any increase in mortality due to HCV infection except at level 6, we determined that we should make no changes to the MMWG assumptions. Further, we noted that the number of deaths from all causes at levels 1 to 5 is within a reasonable range of what would be expected based on the Canada Life Tables. We have therefore assumed that all deaths at levels 1 to 5 will be in accordance with the Canada Life Tables 2009-2011 but that we should allocate those deaths between HCV-related and not HCV-related.

106. Table 106a shows the number of HCV related deaths and non-HCV related deaths at each level by age grouping. Table 106b shows the ratio of HCV related to non-HCV related deaths at each level by age grouping. For these tables, we analyzed only deaths occurring after 1999, so there is no overstatement from the pre-1999 deaths.

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4 In looking at possible variances by haemophiliac status, age and co-infection status, the level 6 deaths were largely ignored since most of them are expected under the medical model and are not excess HCV deaths. We also ignored Level 1 deaths since they are cured and presumably have no liver damage due to HCV.

Table 106a – Number of HCV Related and Non-HCV Related Deaths, 1999 to 2013

		Disease Level						
Age		1	2	3	4	5	6	Total
0-30	HCV Death	-	1	-	1	3	8	13
	Non-HCV Death	4	4	2	1	-	1	12
30-45	HCV Death	-	2	8	-	7	44	61
	Non-HCV Death	6	8	10	1	4	2	31
45-60	HCV Death	-	-	7	2	16	101	126
	Non-HCV Death	16	23	20	7	7	6	79
60-75	HCV Death	-	6	8	6	36	147	203
	Non-HCV Death	42	44	16	5	13	6	126
75-110	HCV Death	-	11	7	5	29	133	185
	Non-HCV Death	106	99	10	5	7	4	231
Totals	**HCV Death**	0	20	30	14	91	433	588
	Non-HCV Death	174	178	58	19	31	19	479
	Total	174	198	88	33	122	452	1067

Table 106b – Ratio of HCV Related and Non-HCV Related Deaths, 1999 to 2013

		Disease Level						
Age		1	2	3	4	5	6	Total
0-30	HCV Death	0%	20%	0%	50%	100%	89%	52%
	Non-HCV Death	100%	80%	100%	50%	0%	11%	48%
30-45	HCV Death	0%	20%	44%	0%	64%	96%	66%
	Non-HCV Death	100%	80%	56%	100%	36%	4%	34%
45-60	HCV Death	0%	0%	26%	22%	70%	94%	61%
	Non-HCV Death	100%	100%	74%	78%	30%	6%	39%
60-75	HCV Death	0%	12%	33%	55%	73%	96%	62%
	Non-HCV Death	100%	88%	67%	45%	27%	4%	38%
75-110	HCV Death	0%	10%	41%	50%	81%	97%	44%
	Non-HCV Death	100%	90%	59%	50%	19%	3%	56%
Totals	**HCV Death**	**0%**	**10%**	**34%**	**42%**	**75%**	**96%**	**55%**
	Non-HCV Death	**100%**	**90%**	**66%**	**58%**	**25%**	**4%**	**45%**

107. The MMWG model provides for HCV related death at level 6 only. Therefore, it is important to remember that we expect a large number of HCV related deaths at level 6. We also expect some non-HCV related deaths at level 6, since there are other causes of death that may affect even the most serious case of HCV. Prior to 2013, the MMWG model made provision for that, but with effect from the 2013 model, the MMWG have assumed that all deaths at level 6 will be as a result of HCV. What the MMWG model does not do is provide for HCV related deaths at levels 1 to 5.

108. With the expectation that the number of cured claimants will increase significantly in the next few years as a result of the new drug treatments, we discussed with Eckler what effect SVC and SVR might have on the excess HCV mortality. Medical experts advised us that while excess HCV deaths will likely be less for a person cured, they will not disappear. The following factors will influence the rate:

    a. any damage done by the disease is not undone by virtue of being cured and it will persist for the balance of life;

    b. any other diseases the claimant has will remain and any effect on that disease(s) from HCV will likely continue to affect the person for some time; and

    c. recovery time for most claimants is likely to be a few months at level 3 to a few years at level 5 with some claimants at level 5 and almost all at level 6 possibly never having a complete recovery from the effects of HCV.

    We decided to make separate assumptions for excess HCV mortality based upon whether the claimant has not cleared the virus and whether they are cured.

109. Table 111 provides the percentage of the deaths based on the Canada Life Table that we will consider as being as a result of HCV. The rest of the deaths based on the Canada Life Tables will be considered as non-HCV related.

110. Using this assumption for excess HCV mortality does not change any of the MMWG population projections other than to take a percentage of the non-HCV related deaths and reclassify them as being as a result of HCV. The total number of deaths projected by the MMWG model in their Table 14, and in particular, the total number of HCV related deaths resulting from the MMWG mortality assumption at level 6 remains unchanged.

111. For example, assume for a particular group that the MMWG model projects 25 HCV related deaths and 75 non-HCV related deaths by 2040. This excess HCV related mortality assumption would apply to the 75 non-HCV related deaths and reclassify some of them. This might result in an additional 30 HCV related deaths with 45 remaining as non-HCV related. We will still have 100 total deaths and we will still have 25 HCV related deaths resulting from the HCV related mortality assumption within the MMWG model at level 6.

Table 111 – Assumption for Percentage of Deaths Classified as HCV-Related

	Disease Level						
	1	2	3	4	5	6	Expected Average
Claimants who have not cleared the virus							
HCV Death	0%	10%	35%	45%	80%	100%	33%
Non-HCV Death	100%	90%	65%	55%	20%	0%	67%
Claimants who have cleared the virus							
HCV Death	0%	0%	0%	25%	60%	100%	22%
Non-HCV Death	100%	100%	100%	75%	40%	0%	78%

112. The expected average in Table 111 does not include HCV related deaths expected to occur at level 6 using the MMWG model. When those deaths are included, the overall percentage of HCV related deaths is 56% for those who have not cleared the virus. That is about the same as we observed among the actual deaths from 1999 to 2013. Including the expected HCV-related deaths at level 6, the overall percentage of HCV-related deaths for those who have been cured is 48%.

6. HEPATITIS C CLAIMANT COHORT

In This Section, we....

- review the incidence of historical claims submissions and approval rates,
- develop our assumptions about the number of future unknown claimants and the timing of their claims, and
- discuss the assumed distribution of claimants by disease level, HIV co-infection and for deceased claimants, cause of death.

113. Both the benefits under the Plan and the assumptions for disease progression differ between transfused and haemophiliac claimants. Therefore, we have separated the claimants into two cohorts, transfused and haemophiliacs.

114. As of the valuation date, the First Claims Deadline has passed and there is now only limited opportunity for a person to file a claim[5]. Two Court Approved Protocols for the adjudication and approval of claims submitted after 30 June 2010 (CAP1 and CAP2) have been adopted since 2010.

115. The ultimate number of claimants is unknown and assumptions are required about the number and disease stage of the future claimants (the "unknown" claimants). There are a large number of claims that were submitted prior to the First Claims Deadline that are still under review and for which a decision about approval has not yet been made. There will likely be some additional claims made under the provisions for late claims.

116. Morneau Shepell and Eckler met and held a number of conference calls during which the expected number of future approvals were discussed and agreement was reached on the size of the expected claimant cohort. This section discusses the rationale used by both actuaries in setting the assumed number and characteristics of the claimant cohort.

117. The known claimants are a fact. The key assumptions required about the claimant cohort are:

    a. Number of unknown (future) claimants;

    b. Timing of the filing of their claims;

    c. Approval rate for acceptance into the Class;

    d. Status at the time of approval (whether they are alive, deceased prior to 1999, deceased since 1 January 1999 and whether death was as a result of HCV);

    e. Disease stage of their illness at the time their claim is filed.

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5 To be accepted after 30 June 2010, the claim must be made within one year of the person attaining his or her age of majority; or the claim must be made within three years of the date the person first learned of his or her infection and the court grants leave to apply for compensation. For a secondarily infected person, the claim must be filed within 3 years of the date the primarily infected person's claim was filed.

118. That information is known for the existing claimants. The following discusses the assumptions made with respect to the unknown claimants.

UNKNOWN TRANSFUSED CLAIMANTS

119. There are 444 claims for transfused claimants that have been filed and for which neither approval nor denial has been issued as of 31 December 2013. The administrator advises that 173 of those claims are considered as "archived" – for various reasons, the administrator believes that they have been abandoned. That leaves 271 claims pending review by the administrator. It is likely that some of these claims will be approved in the future.

120. In addition to these pending claims, there will continue to be some new claims filed in the future that will be adjudicated as late claims.

121. Together, these claims form what is referred to as the unknown claimants. While we have data from the Administrator for all of the pending claims, the information that would be of use in the valuation is sparse. Consequently, there is little or no value to using the pending claim data as a basis for the unknown claimants.

122. Table 122 is a summary of the submitted, approved, denied, pending and archived claims to the end of 2013, based on date of claim submission. (Note that a claim submitted in 2004 that has been approved could have been approved in any year 2004 to 2013). There are also 19 pending claims not included in the table for secondarily infected persons.

Table 122 – Historical Number of Claims Submitted – Transfused

Year	Submitted	Approved	Denied	Pending	Archived	Approval Rate*
2000	2,912	2,051	805	3	53	71%
2001	1,091	655	400	6	30	60%
2002	609	338	248	3	20	56%
2003	338	192	129	2	15	57%
2004	249	127	114	2	6	51%
2005	210	107	85	7	11	53%
2006	170	100	55	8	7	62%
2007	117	52	53	6	6	47%
2008	102	50	41	8	3	53%
2009	101	52	42	5	2	54%
2010 Jan - June	321	95	86	127	13	49%
2010 July	145	15	39	85	6	25%
2010 Aug - Dec	5	0	4	1	0	0%
2011	4	1	2	0	1	25%
2012	53	29	22	2	0	57%
2013	21	6	9	6	0	40%
Total	6,448	3,870	2,134	271	173	63%

* The approval rate is calculated for each year as a percentage of the claims on which a decision has been made. Pending claims are not part of that calculation.

123. The number of claims submitted declined in each year since 2000 and then increased substantially as the First Claims Deadline of 30 June 2010 approached.

124. In addition to the pending claims, we estimate that there will be 98 future claims filed under CAP1 and 77 future claims under CAP2.

Claim Approval Rate

125. The approval rate shown in Table 122 started off by declining in each year, and then stabilized at about 50% to 55%. Since 2010, the initial batch of late claims had a very low approval rate but that has reverted to about 45% under CAP1 and about 85% under CAP2.

126. We have assumed that 55% of the 271 pending claims will ultimately be approved, 45% of the 98 future claims under CAP1 will be approved, 70% of the 77 future claims under CAP2 will be approved and 38% of the 19 secondarily infected claims that are pending will be approved. This gives a total of 254 approved claims assumed to comprise the unknown cohort.

127. Combining the known transfused cohort of 3,924 with the 254 unknown transfused cohort gives a total best estimate cohort of 4,178 claimants.

128. The only anticipated variability in the cohort size would be as a result of a difference in the claims under CAP1 and CAP2. In our opinion, the variability that might occur is not enough to be material and so we have not included any margin in the cohort size as part of the provision for adverse deviations.

Classification of the Unknown Claimants

129. We have allocated the total unknown claimants between those who are alive and those who died based on a review of the new claims approved since 2007. This resulted in 70% of them being for alive claimants, 10% for those who died prior to 1999, 10% for those who died since 1999 from non-HCV causes and 10% for those who died since 1999 as a result of HCV.

130. We assumed that the unknown claimants will be distributed by disease level the same as the known cohort with the alive, deceased after 1998 from HCV and deceased after 1998 from non-HCV distributions separate. No allocation by disease level is required for those who died prior to 1999.

131. These classifications are reflected in Table 146 – Cohort Size below.

UNKNOWN HAEMOPHILIAC CLAIMANTS

132. The 2004 Joint Committee Report discussed the expected claims from haemophiliacs and concluded that it is unlikely that many future haemophiliac claims will be made. There had been a concerted effort made to contact haemophiliacs and the Joint Committee was of the belief that most affected haemophiliacs have submitted their claims. The number of claims submitted since 2004 supports that view. During the period from 2005 to 2009, there were about 10 claims submitted each year and most of them have been approved. In the past three years, there were a total of five claims submitted of which two have been approved, one denied and two remain pending.

133. Table 133 is a summary of the submitted, approved, denied, pending and archived haemophiliac claims to the end of 2013, based on date of submission. (Note that a claim submitted in 2004 that has been approved could have been approved in any year 2004 to 2010).

Table 133 – Historical Number of Claims Submitted – Haemophiliacs

Year	Submitted	Approved	Denied	Pending	Archived	Approval Rate*
2000	843	817	21	1	4	97%
2001	293	282	9	1	1	97%
2002	101	91	9	1	0	91%
2003	80	75	3	1	1	95%
2004	37	29	6	0	2	78%
2005	13	12	1	0	0	92%
2006	11	7	2	2	0	78%
2007	9	8	1	0	0	89%
2008	10	8	0	2	0	100%
2009	12	9	1	2	0	90%
2010 Jan - June	14	9	3	1	1	69%
2010 July	9	2	1	6	0	67%
2010 Aug - Dec	0	0	0	0	0	-
2011	0	0	0	0	0	-
2012	4	2	1	1	0	67%
2013	1	0	0	1	0	-
Total	1,437	1,351	58	19	9	96%

* The approval rate is calculated as a percentage of the claims on which a decision has been made. Pending claims are not part of that calculation.

134. The number of haemophiliac claims submitted has decreased much faster than among the transfused claimants, which is to be expected given the communications campaign. We believe that it is likely that there will be few late claims that meet the criteria for approval.

135. Consequently, for the best estimate assumptions, we have assumed that there will be 12 late claims submitted under CAP1 and none under CAP2.

136. This gives 19 pending claims plus 12 claims to be submitted in the future. To these numbers, we need to apply an assumption about the rate of approval.

Claim Approval Rate

137. We have reviewed the claim approval rate based on the data provided to us for haemophiliacs. Prior to 2010, claims were being approved at close to 100 percent. More recent approvals are sparse, but are averaging about 70%. Because that is based on so few claims, we consider basing an assumption on that 70% alone as inappropriate. We have therefore assumed that 85% of the pending claims and 80% of the future claims will be approved.

138. This gives a total unknown cohort of 26 haemophiliac claimants. Combining that with the known haemophiliac cohort of 1,359 gives a total expected cohort of 1,385 claimants. We have used the same cohort for both the best estimate assumption and the provision for adverse deviation.

Classification of Unknown Haemophiliacs

139. We have allocated the total unknown claimants between those who are alive and those who died based on a review of the new claims approved since 2007. This resulted in 55% of them being for alive claimants, 12.5% for those who died prior to 1999, 20% for those who died since 1999 from non-HCV causes and 12.5% for those who died since 1999 as a result of HCV.

140. We assumed that the unknown claimants will be distributed by disease level the same as the known cohort with the alive, deceased after 1998 from HCV and deceased after 1998 from non-HCV distributions separate. No allocation by disease level is required for those who died prior to 1999.

141. For the known claimants, we have reflected their actual status for HIV co-infection.

142. In our opinion, it is reasonable to assume that most of the alive co-infected haemophiliacs who will file a claim have done so, since co-infection results in a faster progression of the disease. Given the small number of unknown haemophiliac claimants expected, we decided to ignore the likelihood that there will be fewer future coinfected claimants than among the known cohort. We therefore have assumed that the unknown claimants will have a similar rate of HIV infection as the alive known haemophiliacs – 25.7%.

ASSUMED CLAIMANT COHORT

143. Tables 146a and 146b show the distribution of claimants by level based on the administrator's data for the known cohort and the assumptions outlined above for the unknown cohort. We have adjusted the claimants at level 3 to split them between stages F1 and F2. The MMWG allocated 50% of the level 3 claimants to each of those disease stages and we have done the same.

144. The MMWG made some additional adjustments for disease stages based on their analysis of the data. While those adjustments likely improved the accuracy of the data for the purposes of modelling the disease, they are not appropriate for estimating the future financial liability of the fund. (See discussion at paragraphs 91 to 96). We have therefore ignored the additional data changes made by the MMWG.

145. For those at level 6, the data contained indicators for allocating the claimants between decompensated cirrhosis, cancer, liver transplant and (new for 2013) renal failure, lymphoma, glomerulonephritis and cryoglobulinemia. We were advised by the MMWG that lymphoma should be treated the same as decompensated cirrhosis. For claimants with glomerulonephritis, cryoglobulinemia and renal failure (referred to as "atypical level 6" claimants), we were advised that they would be excellent candidates for treatment with sofosbuvir doublets. Following

treatment, those with cryoglobulinemia are expected to have a good recovery and lead a relatively healthy life. We assumed that the others would remain ill and likely continue to require any disability benefits and cost of care benefits in accordance with the assumptions for all other claimants.

146. We noted that a number of atypical level 6 claimants have been on disability benefits for some time. We assumed that following treatment, the disability benefits would continue with no assumed recovery. We assumed that ⅓rd of them (those with renal failure) would have future cost of care claims and that ⅔rds of the deaths would be as a result of HCV.

147. The following summarizes the assumptions regarding cohort size. The best estimate and provision for adverse deviations assumptions are the same for 2013, but differed in prior years.

Table 146a – Cohort Size – Transfused Claimants - 2013

Disease Level	Disease Stage	Known Claimants	Unknown Claimants	Total
Alive Claimants				
1	F0 – RNA-	510	32	542
2	F0 – RNA+	993	62	1,0545
3	F1	449	28	477
3	F2	449	28	477
4	F3	175	11	186
5	Cirrhosis	158	10	168
6	Decompensated	36	4	40
6	Lymphoma	5	0	5
6	Renal	8	0	8
6	Cryoglobulinemia	10	0	10
6	Glomerulonephritis	2	0	2
6	Transplant	16	1	17
6	HCC	10	1	11
Total Alive		**2,821**	**177**	**2,998**
Deceased				
Died before 1999	All	184	25	209
Died after 1998 - non HCV	F0 – RNA-	179	10	189
	F0 – RNA+	166	10	176
	F1	46	3	49
	F2	-	0	-
	F3	17	1	18
	Cirrhosis	18	1	19
	Level 6	13	1	14
Died after 1998 - HCV	F0 – RNA-	-	0	-
	F0 – RNA+	19	1	20
	F1	23	1	24
	F2	-	0	-
	F3	11	1	12
	Cirrhosis	73	4	77
	Level 6	354	19	373
Total Deceased		**1,103**	**77**	**1,180**
Total Cohort		**3,924**	**254**	**4,178**

Table 146b – Cohort Size – Haemophiliac Claimants - 2013

Disease Level	Disease Stage	Known Claimants	Unknown Claimants	Total
Alive Claimants				
1	F0 – RNA-	146	2	148
2	F0 – RNA+	192	3	195
3	F1	163	3	166
3	F2	163	3	166
4	F3	81	1	82
5	Cirrhosis	82	1	83
6	Decompensated	26	1	27
6	Lymphoma	3	0	3
6	Renal	-	0	-
6	Cryoglobulinemia	4	0	4
6	Glomerulonephritis	1	0	1
6	Transplant	6	0	6
6	HCC	10	0	10
Total Alive		**877**	**14**	**891**
Deceased				
Died before 1999	All	301	3	304
Died after 1998 - non HCV	F0 – RNA-	9	1	10
	F0 – RNA+	17	2	19
	F1	12	2	14
	F2	-	0	-
	F3	1	0	1
	Cirrhosis	8	1	9
	Level 6	3	0	3
Died after 1998 - HCV	F0 – RNA-	-	0	-
	F0 – RNA+	1	0	1
	F1	9	0	9
	F2	-	0	-
	F3	2	0	2
	Cirrhosis	22	1	23
	Level 6	97	2	99
Total Deceased		**482**	**12**	**494**
Total Cohort		**1,359**	**26**	**1,385**

149. Tables 148a and 148b summarise the cohort assumptions for the 2010 sufficiency review.

Table 148a – Cohort Assumption for Transfused Claimants – Best Estimate 2010

Status	Known Claimants	Unknown Claimants	Total
Alive	2,800	187	2987
Deceased prior to 1999	179	5	184
Deceased after 1998			0
- HCV related	422	35	457
- Non-HCV related	396	12	408
Total Deceased	997	52	1049
Total Transfused Cohort - 2010	**3,797**	**239**	**4,036**

Table 148b – Cohort Assumption for Haemophiliac Claimants - Best Estimate 2010

Status	Known Claimants	Unknown Claimants	Total
Alive	892	26	918
Deceased prior to 1999	301	8	309
Deceased after 1998			0
- HCV related	113	6	119
- Non-HCV related	43	0	43
Total Deceased	457	14	471
Total Haemophiliac Cohort - 2010	**1,349**	**40**	**1,389**

7. ASSETS

PLAN FUNDING

In This Section, we....

- summarize the Plan's funding principles,
- show the Plan's assets by type of investment,
- summarize past investment performance, and
- summarize the effect of investment return on the Plan's surplus.

150. Funding of the Plan is shared between the federal and provincial/territorial governments. The federal government has paid its full share of $846,327,527 (8/11^{ths} of the total).

151. The provincial/territorial governments pay their share (initial amount of $323,995,909 as of 22 October 1999) as benefits and expenses are paid, with an optional prepayment provision. Any unpaid balance grows with interest based on three-month Treasury-bill rates.

152. The invested assets are invested primarily in real return bonds, with a lesser portion invested in equities, bonds, and short-term securities.

153. The assets are split between a Long Term Fund, a Short Term Fund and a Notional Fund. The main investments of the fund are made through the Long Term Fund. The Short Term Fund is used as the source of assets to pay benefits. As benefits are paid, the Short Term Fund is replenished by a transfer from the Long Term Fund as necessary. The Notional Fund represents the contributions owing from the provincial/territorial governments.

SUMMARY OF PLAN ASSETS

154. In Table 154, we have shown the asset information taken directly from the Eckler Investment Summary Report as of 31 December 2013, which was included in the Joint Committee's Annual Report for Year 14.

*Table 154 – Summary of Plan Assets as of 31 December 2013 and 2010**

Description	Assets at 31 Dec 2013 ('000s)	Percent of Invested Assets	Percent of Total Assets	Assets at 31 Dec 2010 ('000s)
Invested Assets				
Real Return Bonds	$ 697,549	67.9%	58.6%	$ 776,979
Bonds	56,253	5.5%	4.7%	43,104
Canadian Equity	82,677	8.0%	6.9%	50,361
U.S. Equity	49,555	4.8%	4.2%	17,972
International Equity	49,420	4.8%	4.2%	19,945
Cash and short term	475	0.0%	0.0%	85
Long Term Fund Total	935,929	91.0%	78.6%	908,445
Short Term Fund	92,119	9.0%	7.7%	81,329
Total Invested Assets	1,028,048	100.0%	86.4%	989,775
Notional Assets				
Provincial/Territorial Obligation[6]	162,152		13.6%	187,487
Total Plan Assets	**$ 1,190,200**		**100.0%**	**$ 1,177,262**

** The above amounts are taken from the Eckler Investment Summary Report as of 31 December 2013.*

155. Past investment returns are summarized in Table 155 based on information contained in the Eckler Investment Report for 2013 and for prior years.

Table 155 - Investment Returns – 2000 to 2013

Year	Invested Assets	Notional Assets	Combined
2000	11.4%	5.4%	9.8%
2001	2.4	4.4	3.1
2002	9.3	2.4	7.6
2003	11.8	2.9	9.7
2004	14.4	2.3	11.7
2005	12.7	2.6	10.6
2006	0.8	4.0	1.4
2007	2.3	4.2	2.7
2008	- 1.6	2.5	- 0.8
2009	12.0	0.4	9.8
2010	8.9	0.5	7.5
2011	11.4	0.9	9.8
2012	3.8	0.9	3.4
2013	-2.8	1.0	-2.3

6 As of 31 December 2013, Yukon has prepaid $14,000 of their obligation. As of 31 December 2010, Alberta and Yukon had prepaid $391,000 of their obligation. These prepayments are shown as an invested asset.

CHANGES IN ASSETS 2011 TO 2013

156. The information in Table 156 is taken from the Eckler Report where the changes in assets during the three-year period 2011 to 2013 are summarized. The pre-payments by provinces and territories are transferred from the invested assets to the notional assets for this presentation so that the allocation of benefit payments and fees will reflect the 8/11ths federal government and 3/11ths provincial/territorial governments split under the Plan.

Table 156 – Changes in Assets – 2011 to 2013 ($,000's)

	Invested Assets	Notional Assets	Total
Assets at 31 Dec 2010	$989,775	$187,487	$1,177,262
Transfer provincial/territorial prepayments to notional assets	-391	391	-
Adjusted assets at 31 Dec 2010	**989,384**	**187,878**	**1,177,262**
Investment income	120,177	4,837	125,014
Benefit payments	-75,047	-28,119	-103,166
Expenses and fees	-6,480	-2,430	-8,910
Adjusted assets at 31 Dec 2013	**1,028,034**	**162,166**	**1,190,200**
Transfer provincial/territorial prepayments to invested assets	14	-14	-
Assets at 31 Dec 2013	**$1,028,048**	**$162,152**	**$1,190,200**

157. The 2010 valuation assumed that the total assets would earn a best estimate return of 3.53% per annum after investment management fees (which includes 2.25% to cover expected inflation). The assumption including a provision for adverse deviations was a return of 3.3%. During the three-year period, inflation averaged 1.5% per annum. The actual average return of the total fund over the past three years was 3.3% per annum.

EFFECT OF INVESTMENT RETURN ON PLAN SURPLUS

158. With the Plan assets invested in the equity and bond markets, rates of return will fluctuate over time. An obvious source of fluctuating returns will be the equity investments, which are subject to the volatility of the markets. This will give rise to capital gains and losses. The overall effect on the fund will be minor since the equity investments are a small portion of the fund.

159. The major component of fluctuating returns will likely be from changes in the rate of return expectations of bond investors, primarily as this affects the real return expectations. When interest rates decrease, the market value of bonds will increase. Over the 2001 to 2012 period, we saw a gradual and steady decline in interest rates, with the result that the Real Return Bond assets increased in value from the resulting capital gains.

160. During 2013, interest rates rose slightly and that resulted in a capital loss on the real return bonds in the portfolio.

161. However, because of the nature of the Plan assets and the Plan liabilities, any increase in assets due to declining interest rates will be offset by an increase in liabilities. The converse is also true. If interest rates should continue to increase, the Plan assets will suffer capital losses, but they will be offset by a decrease in the Plan liabilities.

162. Virtually all of the Plan benefits are subject to inflation increases. As long as the amount of Plan assets invested in real return bonds equals or exceeds the Plan liabilities (including fees and expenses), future changes in inflation will have no or very little effect on the Plan's financial position. This is because real return bonds provide a return equal to inflation plus the real rate of return on which they were priced. So any changes in the amount of benefit to be paid due to inflation will be covered by the return from the real return bonds.

163. Provided Plan liabilities are calculated based on an interest rate equal to the current market yield for real return bonds, changes in the real rate of return will be largely offsetting between the assets and liabilities.

8. FINANCIAL RESULTS

In This Section, we....

- discuss the appropriate use of best estimate assumptions, and the importance of making a provision for adverse deviations in the liabilities,
- set out the present value of future compensation payments and administration expenses;
- present a summary of the overall financial position of the Plan;
- discuss the amount of provision for adverse deviations that is reasonable; and
- review the experience gains and losses over the past three years.

164. The valuation model used in calculating these liabilities is discussed in Appendix C. Essentially, the model projects the disease progression of Hepatitis C for each person based upon the annual probabilities for transition through the various stages of the disease. These probabilities were taken from the MMWG report and are summarized, along with all of the actuarial assumptions used, in Appendix D – Summary of Actuarial Assumptions.

165. In this report, we show results on a best estimate basis as well as results including a provision for adverse deviations.

166. The best estimate results are based on actuarial assumptions that in our opinion represent the most likely expectation for the future. This means that there is approximately a 50% chance that future experience will be better than the assumption and a 50% chance that it will be worse. In this way, the resulting best estimate actuarial liabilities represent the amount of assets required so there is approximately a 50% chance of having too much funds and a 50% chance of having too little funds.

167. It is neither appropriate nor prudent to assess the sufficiency of the Fund using best estimate assumptions. Since there is an agreement that no additional monies will be provided to the Fund by the governments, it is prudent to assess the financial sufficiency of the Fund utilizing a basis that has a greater chance than 50% of having sufficient assets to pay all future benefits. This is done through the use of conservatism in the actuarial assumptions. Conservatism is introduced through the use of assumptions that represent the best estimate for the future *plus* a provision for adverse deviations. While it is possible that actual experience differing from our best estimate may be positive (reducing the Plan liabilities), this should not be recognized until such time as a positive deviation has occurred.

168. The use of best estimate results together with results including a provision for adverse deviations permits the user of this report to assess the level of conservatism inherent in the results and therefore gain an insight into the resulting level of conservatism. Ultimately, it is an issue of individual judgement as to the amount and degree of provision for adverse deviations that is prudent to recognize, having regard to the interest of all parties to the Settlement Agreement

169. The following two tables summarize our results by benefit. The results obtained by Eckler are, from a materiality perspective, essentially the same as these.

Table 169a – Transfused Claimants – Financial Results as at 31 December 2013 (in '000s)

Plan Section	Benefit	Best Estimate	Including Provision for Adverse Deviations
4.01(1)(a)	Level 1: $10,000 – positive anti-HCV	$3,082	$3,082
4.01(1)(b)	Level 2: $20,000 – PCR Test positive	5,033	5,033
4.01(1)(c)	Level 3: $30,000 – Non-bridging fibrosis	9,980	12,359
4.01(1)(d)	Level 5: $65,000 – Cirrhosis	13,157	20,244
4.01(1)(e)	Level 6: $100,000 – Decomp/cancer	24,421	32,719
4.01(3)(a)	Loss of income- non-bridging fibrosis	5,370	5,700
4.01(3)(b)	Loss of services- non-bridging fibrosis	12,363	13,036
4.02	Loss of income	19,606	26,292
4.03	Loss of services	50,780	63,234
4.04	Cost of care	16,887	32,154
4.05	HCV drug therapy	6,670	7,311
4.06	Uninsured treatment - HCV cure drugs	95,677	129,266
4.06	Uninsured treatment – non-HCV cure drugs	2,935	3,011
4.07	Out-of-pocket expenses	4,033	5,700
	Secondarily infected	-	-
4.08	HIV secondarily infected	-	-
	Pre-1999 deaths		
5.01	– lump sums	2,867	2,909
5.01(1)	– funeral	108	109
6.01(1)	– Loss of Support	2,518	2,551
6.01(2)	– Loss of Services	8,377	8,531
	Pre-1999 deaths sub total	13,870	14,100
	Post 1999 deaths		
5.02	– funeral	1,588	2,031
6.01(1)	– Loss of Support	12,865	16,101
6.01(2)	– Loss of Services	55,568	61,844
6.02	Loss of Care and Guidance	19,402	24,568
	Outstanding Payments	6,390	6,390
	Atypical Level 6 Claimants	7,437	7,437
	Total	**$387,114**	**$491,612**

Table 169b - Haemophiliacs – Financial Results as at 31 December 2013 (in '000s)

Plan Section	Benefit	Best Estimate	Including Provision for Adverse Deviations
4.01(1)(a)	Level 1: $10,000 – positive anti-HCV	$269	$269
4.01(1)(b)	Level 2: $20,000 – PCR Test positive	538	538
4.01(1)(c)	Level 3: $30,000 – Non-bridging fibrosis	1,627	2,085
4.01(1)(d)	Level 5: $65,000 – Cirrhosis	5,631	8,191
4.01(1)(e)	Level 6: $100,000 – Decomp/cancer	13,327	16,662
4.01(3)(a)	Loss of income- non-bridging fibrosis	972	1,127
4.01(3)(b)	Loss of services- non-bridging fibrosis	2,557	2,614
4.02	Loss of income	26,210	30,079
4.03	Loss of services	28,010	31,718
4.04	Cost of care	10,142	18,059
4.05	HCV drug therapy	1,657	1,816
4.06	Uninsured treatment - HCV cure drugs	20,302	27,330
	Uninsured treatment – non-HCV cure drugs	3,715	3,799
4.07	Out-of-pocket expenses	2,856	4,203
	Secondarily infected	-	-
4.08	HIV secondarily infected	-	-
4.08(2)	$50,000 lump sum option for co-infected	202	202
	Pre-1999 deaths		
5.01	– lump sums	345	350
5.01(1)	– funeral	13	13
6.01(1)	– Loss of Support	9,040	9,186
6.01(2)	– Loss of Services	13,779	14,137
	Post 1999 deaths		
5.02	– funeral	757	903
6.01(1)	– Loss of Support	22,165	24,973
6.01(2)	– Loss of Services	41,636	45,963
6.02	Loss of Care and Guidance	10,676	12,711
	Outstanding Payments	5,521	5,521
	Atypical Level 6 Claimants	2,022	2,022
	Total	**$223,969**	**$264,471**

170. In addition to compensation payable to HCV claimants, the fund must also cover the expenses of the Joint Committee, the administrator and various consultants and other parties. The annual amount of these expenses is detailed in Section 11 - Actuarial Assumptions. We have used the same expected annual fee amounts for both best estimate and provision for adverse deviations calculations. The differences in liabilities are due solely to the interest rates. Expenses related to investment management are not included in this section as they are implicitly recognized in the investment rate of return.

171. The present value of the future expected expenses is as follows:

Table 171 – Present Value of Future Fees and Expenses (in '000s)

Fees and Expenses	Best Estimate	Provision for Adverse Deviation
Actuarial	$ 8,026	$ 8,345
Accounting and expert testimony and assistance	409	425
Administration	15,219	15,839
Arbitrators/Referees	294	305
Audit	2,503	2,606
Canadian Blood Services	250	261
Communications	434	451
Fund Counsel	1,386	1,434
Héma-Québec	75	78
Independent Counsel	250	261
Joint Committee	16,608	17,235
Medical Modelling	1,909	1,984
Monitor	924	956
Software Development	250	261
Taxes – HST and GST	4,918	5,111
Total	**$ 53,455**	**$ 55,552**

HIV PROGRAM

172. In addition to the HCV benefits, the Fund is also responsible for making benefit payments under the HIV Program of $240,000 to each eligible claimant. This results in a best estimate liability of $950,000 and $970,000 including a provision for adverse deviations for the HIV Program.

173. Table 173 presents a summary of the overall financial results of the Plan together with comparative liabilities from 2010. The 2013 results are similar to those Eckler obtained.

Table 173 - Summary of Financial Results as at 31 December 2013 with 2010 comparatives (in '000s)

	Best Estimate		Provision for Adverse Deviations	
	2013	2010	2013	2010
Assets	$ 1,190,199	$ 1,177,262	$ 1,190,199	$ 1,177,262
Liabilities				
▪ Transfused	387,114	412,012	491,612	528,404
▪ Haemophiliacs	223,969	242,240	264,471	284,150
▪ HIV Program	950	1,100	970	1,100
▪ Fees & Expenses	53,455	34,091	55,552	34,658
Total Plan Liabilities	665,488	689,443	812,605	848,312
Fund Surplus (Deficit)	**$524,711**	**$487,819**	**$377,594**	**$328,950**
Additional buffer against catastrophic events			121,000	-
Excess Assets			**$256,594**	**$328,950**

174. The difference in the total liabilities with provision for adverse deviations compared to the total best estimate liabilities is a measure of the degree of conservatism included in the results. The provision for adverse deviations for 2013 is about 22% greater than the best estimate liabilities. As at 31 December 2010, it was about 23% greater than the best estimate liability.

175. With the passage of time, the degree of uncertainty about many of the assumptions, (such as the ultimate cohort size, claiming patterns, and disease progression) is reduced. With lower uncertainty, the provision for adverse deviations should also decrease.

176. With this valuation, the introduction of new drugs with their high efficacy has increased the uncertainly for items that are related to treatment. We have very limited data about the cost of the new drugs, the degree to which provincial health plans and private insurance will contribute toward the cost, the actual efficacy of the various drugs and the effect clearing the virus will have on disability benefits and excess HCV mortality. Nevertheless, we had to make assumptions about these items. This increased uncertainty suggests a larger provision for adverse deviations in 2013.

177. There are some other assumptions where we believe the degree of uncertainty has decreased to the point that very little provision for adverse deviations is warranted. The unknown cohort size is unlikely to deviate materially from the assumed number, existing loss of income and loss of

services benefits are likely to decrease if anything due to the new drug treatments and existing loss of support and loss of services benefits are unlikely to vary in the future.

178. Interest and inflation are often major risk factors for many invested funds. As discussed in Section 9 - Analysis of Sensitivity, interest and inflation should be of limited risk for this Plan as a result of the type of investments used.

179. While there are many other assumptions made in the course of this valuation, the rest of the assumptions have a relatively minor effect on the financial results.

180. About half the liabilities are subject to a low degree of uncertainty and about half to a high degree of uncertainty. In my opinion, a 30% to 35% provision for adverse deviations for the liabilities for which there is a higher uncertainty and a 10% to 15% provision for adverse deviations for the liabilities for which there is a low degree of uncertainty is appropriate. Combined, that gives an overall provision for adverse deviations of about 20% to 25%.

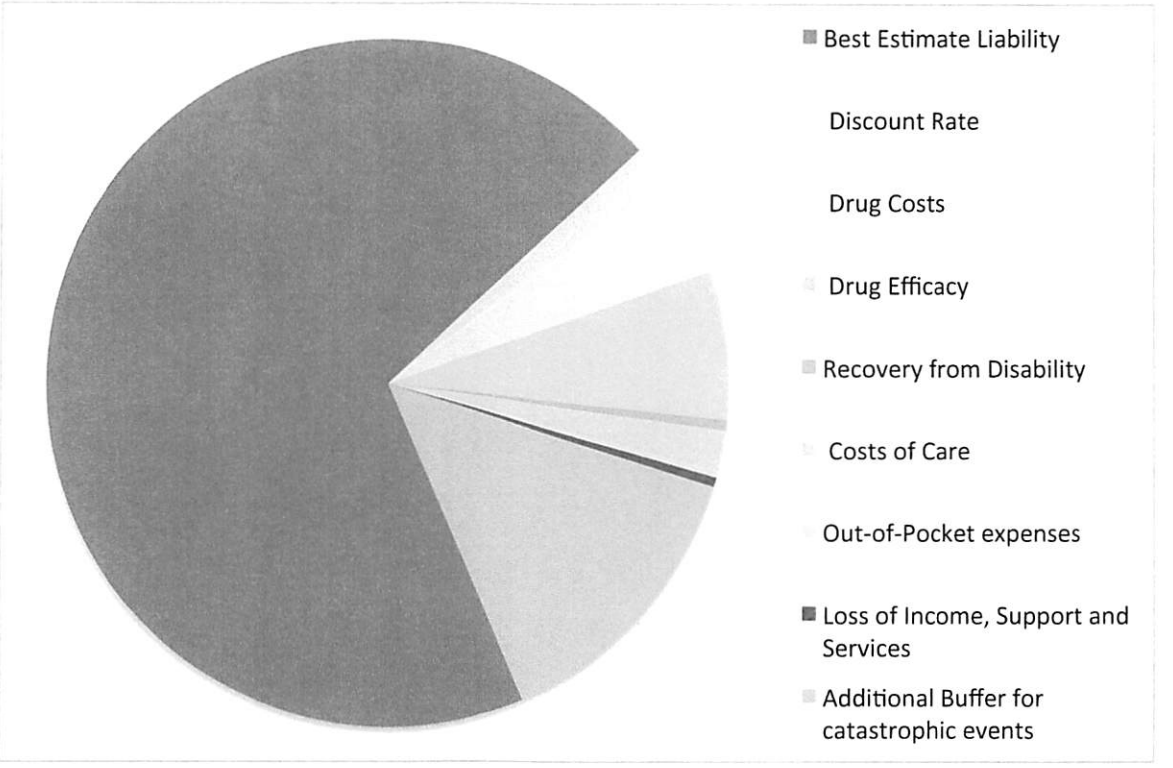
181. In our opinion, the overall average 22% provision for adverse deviations is appropriate for the 2013 sufficiency review.

182. Table 182 shows the development of the provision for adverse deviations liability starting from the best estimate and adding the various components of the provision. Chart 182 shows the relative size of these provisions.

Table 182 – Development of Provision for Adverse Deviations Liability

Item	Amount ('000s)
Best Estimate Liability	$ 665,488
Discount Rate	16,747
Drug Costs	40,922
Drug Efficacy	61,503
Recovery from Disability	4,512
Costs of Care	16,736
Out-of-Pocket expenses	2,719
Loss of Income, Support and Services	3,978
Provision for Adverse Deviations Liability	***$ 812,605***
Additional buffer for catastrophic events	121,000
Total Liability including Additional Buffer	**$ 933,605**

Chart 182 – Amount of Provision for Adverse Deviations and Catastrophic Events



ADDITIONAL BUFFER AGAINST CATASTROPHIC EVENTS

183. The provision for adverse deviations recognizes that assumptions about the future may prove to be wrong and increases the confidence that the total liability including the provision for adverse deviations will be sufficient to meet emerging benefits as they become payable. It is not intended to cover catastrophic events that may occur. An additional buffer is required if it is considered appropriate to make a provision in case such events occur.

184. An additional buffer is not always necessary. There may be situations where insurance or guarantees are available to reduce the risk of insufficiency. As a fund with no available source of additional monies, in our opinion, the Fund is in a position where an additional buffer is appropriate.

185. Catastrophic events can be grouped into two categories - those that are reasonable to imagine occurring and those that are extremely remote. For example, if you were to flip a coin 100 times and had to pay out $1,000 for every head but you received $1,000 for every tail, your best estimate liability would be zero. (You would expect to flip 50 heads and thereby pay $50,000 and also flip 50 tails and receive $50,000). Adverse deviations would be any result that produced more heads than tails since that would give a result where you would have to pay. There is about an 86% probability that you will flip no more than 55 heads, or turning that around, about 14% of

the time you will lose more than $10,000. That might be a reasonable assumption to make for determining a provision for adverse deviations.

186. Flipping more than 55 heads would quickly get you into the catastrophic territory – for example flipping 60 heads would result in a loss of $20,000. The probability of flipping 60 or more heads in 100 tosses is less than 2%. That could be taken as a reasonable basis to be used for an additional buffer for catastrophic events.

187. Setting a buffer for the catastrophe that might happen once in 1,000 occurrences is likely not appropriate. (In our coin flip example, that would be similar to getting at 65 or more heads). But it is appropriate to consider a catastrophic event that might occur no more than 1% or 2% of the time (60 or 61 heads).

188. In my opinion, for the compensation fund, a reasonable buffer against catastrophic events would be an additional 15% of the total liabilities including the provision for adverse deviations. That produces a buffer of $121 million.

189. Eckler has determined a buffer by developing an HCV-specific framework for assessing the appropriate amount of additional assets estimated to be sufficient to meet reasonable catastrophic events. They refer to this buffer as "required capital". Their approach is similar to that utilized in the insurance industry in Canada. The determination of the required capital attempts to look at catastrophic events and quantify the resulting cost. In our 2010 report, we provided commentary on that approach as it was used in 2010. We have had some discussions with Eckler about the basis they have used for 2013 and the results produced. For example, one of the catastrophic events that they have modeled is the possibility that the efficacy of the new drugs would be only 67% of the efficacy rates set out in the MMWG report. That would be a catastrophic event from the perspective of the Fund as it would increase the liabilities. It is remote enough to be outside the considerations that influence a provision for adverse deviations, but not so remote that it should be ignored for purposes of an additional buffer.

190. Based on our discussions with Eckler and the amount of the additional buffer that Eckler has determined, we agree that the basis they used and the additional buffer they determined are reasonable.

ANALYSIS OF EXPERIENCE GAINS AND LOSSES

191. In the valuation as of 31 December 2010, we made assumptions about the future. During the past three years, actual experience has developed differently from those assumptions. This is normal and to be expected. It is good practice to review the sources of these experience gains and losses to identify where these differences occurred. Table 191 summarizes the various factors that resulted in a change in the best estimate surplus from 2010 to 2013.

192. This analysis is expected to differ from the Summary of Change in Excess Assets contained in the Eckler Report at paragraph 202. Eckler start with the amount of excess assets, or surplus, based

on their 2010 sufficiency assumptions whereas Morneau Shepell start with the amount of surplus based on the 2010 best estimate assumptions. These differing bases are appropriate, consistent with actuarial Standards of Practice and do not constitute a difference of opinion between the two actuaries.

Table 191 – Analysis of Change in Surplus from December 2010 to December 2013

Description		$,000s
Surplus as at 31 December 2010		$487,819
Interest on the surplus		53,957
Expected surplus at 31 December 2013		541,776
Effect of Experience differing from assumptions		
Gain on Investments other than for inflation	16,478	
Loss on Investments due to CPI increasing less than expected	(14,220)	
Gain from pension index causing benefits to increase less than assumed	12,738	
Loss from benefits paid during past three years greater than assumed	(5,201)	
Loss on expenses and fees more than assumed during 2007 to 2010	(1,673)	
Loss from changes to the claimant cohort	(26,461)	(18,339)
Effect of Changes in Assumptions		
Changes to the valuation model	(60,813)	
Loss from changing timing of last payment for Loss of Services to dependants	(8,670)	
Loss from changes to the MMWG disease progression rates	(5,316)	
Gain from change to expected mortality rates	716	
Gain from changing expected percent of cohort claiming a Loss of Income or Loss of Services benefit	9,640	
Gain from adding assumption about recovery from loss of income and loss of services	10,149	
Loss from changing the percent of cohort claiming a cost of care benefit	(15,860)	
Loss from changes to Out-of-Pocket expenses	(3,391)	
Loss from cost of new drug treatments	(94,630)	
Gain from new treatment rates and efficacy	193,060	
Loss from increased expectation for future fees and expenses	(23,289)	
Gain from all other assumption changes	252	
Miscellaneous gains/losses	(574)	1,274
Surplus at 31 December 2013		**$ 524,711**

193. In total, the amount of surplus on a best estimate basis increased by about $37 million over the three years from 2011 to 2013. The individual components of that change varied with the

experience gains totalling $297 million and the experience losses totalling $260 million, giving a net gain of $37 million.

194. Normally, we expect a mixture of gains and losses. Over time, we would expect that the best estimate gains and losses will balance out – provided future experience on average is similar to the best estimate assumptions.

195. The following provides a brief explanation of the various components of the gains and losses shown in Table 191.

    a. ***Interest on the Surplus:*** The surplus as at 31 December 2010 was part of the assets and as such was invested and earning investment income. This interest is the amount of interest that we would have expected to make on the surplus based on the best estimate interest rate of 3.53% used in the 2010 valuation.

    b. ***Gain in value of investments***: When interest rates decrease, the market value of bonds increase. This gain is largely due to the increase in value of the real return bonds due to the decrease in interest rates.

    c. ***Loss on investments due to CPI increases***: This looks at the impact of expected and actual inflation on the investment earnings of all the Fund's assets. This loss is partially offset by the gain due to changes in the pension index discussed in item (d) below.

    d. ***Gain from pension index***: The increases in the pension index during the past three years were less than expected causing benefits to increase less than assumed. This had a small impact on the benefits paid during the past three years. The bulk of this gain is due to lower amounts of future benefit payments as a result of the lower level of increases from 2011 to 2013.

    e. ***Loss from benefits paid***: The actual benefits paid to class members during the last three years were $5 million greater than was assumed in the last valuation.

    f. ***Loss on expenses and fees***: The actual expenses and fees paid during the period 2011 to 2013 were about $1.7 million more than assumed in 2010.

    g. ***Loss from changes to the claimant cohort***: The progression of the known cohort was different than assumed in the 2010 valuation. There were fewer recoveries from HCV reported to the administrator than we assumed and more claimants at levels 3 and 6. All that was offset by fewer claimants advancing to levels 4 and 5 and fewer deaths than expected. In total, the transition of the known cohort produced a modest gain. However, there were more new approvals than expected and they were somewhat more advanced in the disease than assumed. We also increased the number of future new claimants for the future, an assumption change that is reported together with the changes from the known cohort.

h. ***Model Changes***: As a result of discussions with the MMWG and with Eckler, a number of refinements were made to our valuation model. This is the financial effect of all of those refinements.

i. ***Loss from changing timing of last payment for Loss of Services to dependants***: In our discussions with Eckler, we found that we had applied the final payment timing differently. This reflects bringing our assumptions into sync with the last payment to dependants occurring at the end of the final year.

j. ***Loss from change to disease progression rates***: The future disease progression rates reported in the 2013 MMWG report were, on average, slightly higher than the cohort-based progression rates utilised in the 2010 valuation. Those higher progression rates resulted in a loss of $5 million.

k. ***Mortality Rates***: This gain is made up of three components, each of which contributed a portion of the gain. The HCV-related mortality at level 6 was reduced for all instances in the 2013 MMWG Report. There was a small refinement to the excess HCV mortality rates. The population mortality table utilised was updated to the Canadian Life Table 2009-2011, which contained reductions in all mortality rates for ages 28 and older.

l. ***Gain from change to Loss of Income and Loss of Services***: Historical claims for Loss of Income and Loss of Services suggests that the percentage of class members who will claim for one of these losses is somewhat less in aggregate than assumed in the 2010 valuation. We adjusted our assumption to reflect this. We also adjusted the relative percentages of claimants who are assumed to claim loss of income or loss of services prior to age 65.

m. ***Gain from recovery from disability***: As a result of the new drug treatments, we added an assumption to estimate the future recovery of claimants from disability benefits (loss of income and loss of services) following a successful treatment.

n. ***Loss from change to percent claiming cost of care benefits***: Historical claims for cost of care suggests that the percentage of class members who will claim for this is slightly lower than assumed in the 2010 valuation. That, however, is offset by a higher average benefit amount.

o. ***Out-of-Pocket Expenses***: We made two changes to the out-of-pocket expense assumption for 2013. One was the method used to apply the assumption and the other was to add an assumption for the claimants who clear the virus to reflect the likelihood that there will be some follow up medical appointments required after clearing the virus. That is all offset by the gain due to fewer claimants having future out-of-pocket expenses as a result of being cured.

p. ***Loss from new drug treatments (cost of drugs)***: The new drug treatments that we assumed would be utilised in the future cost significantly more than prior treatments and they are expected to be utilised by most of the claimant cohort above disease level 2. The cost of these

drugs is a significant increase to the Fund. While the use of these drugs is expected to cure most claimants from HCV and thereby reduce future claims, this item shows the expected future cost of the drugs to be used in future treatments.

q. ***Gain from treatment rates and efficacy:*** This item measures the gain arising from the increase in the percent of claimants assumed to be treated and the greatly increased efficacy of the new drugs. This is a measure of the liability reduction expected as a result of the new drugs.

r. ***Loss from expected future expenses and fees***: The future expected expenses and fees are projected to 2063, 35 years longer than was projected in 2010. The change in the annual expenses for future years is an increase of about $23 million.

s. ***Change from all other assumptions***: There were a number of other assumption changes that were minor in effect. The net total impact of these changes was a gain of less than $1 million.

t. ***Miscellaneous gains and losses***: The analysis of experience gains and losses involves assumptions and estimations. A detailed and more accurate determination is not economically feasible. Normally, the analysis of experience gains and losses will require the use of a balancing item that is the total effect of the assumptions and estimations used in the analysis. The miscellaneous gain is less than $1 million.

PROVINCIAL/TERRITORIAL CONTRIBUTION SHORTFALL

196. The Fund includes invested assets, which arise from the federal government's contribution of $846 million, plus a provincial/territorial obligation to contribute 3/11^{ths} of all benefit and expenses paid out of the Fund. There is a cap to the provincial/territorial contribution obligation, originally $324 million, of which $162 million remains as of 31 December 2013[7]. The provincial/territorial contribution obligation is increased by interest at the three-month Treasury Bill rate and reduced by any contributions made.

197. Based on future expected benefit payments and expenses from the fund (see Section 10 - Projected Cash Flow of Compensation Benefits), we estimate that the provincial/territorial contribution obligation will be fulfilled by the end of 2024 under the best estimate assumptions and by 2021 including a provision for adverse deviations. After those dates, any remaining benefits could only be paid out of the fund with no provincial/territorial contribution.

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7 The $162 million provincial/territorial contribution obligation includes $14,000 that has been prefunded by Yukon.

198. In our 2010 Report, we had projected the provincial/territorial contribution obligation would be fulfilled about 12 years later – 2036 for the best estimate and 2032 for the provision for adverse deviations. The main reason for the much earlier date is due to the costs associated with the new treatment. Those costs have accelerated many of the expected cash flows that would have occurred over the future life of the fund to now occur over the period 2014 to 2018.

9. ANALYSIS OF SENSITIVITY

In This Section, we....

- review the effect of changes in the key assumptions on the resulting liabilities, and
- discuss the reasons why the Plan is largely protected from changes in interest and inflation rates.

199. The results presented in this report are based on assumptions about what will happen in the future. Many of these assumptions have a relatively minor effect on the resulting liabilities. Some of the assumptions have a greater effect on the results than others.

200. The purpose of a sensitivity analysis is to help the user to gain an understanding of the possible financial effect of changes in the more material assumptions.

Table 200 – Sensitivity Analysis (in '000s)

Assumption Change[8]	Best Estimate	Provision for Adverse Deviations
Total Liability (transfused and haemophiliac claimants)	$665,488	$812,605
Increase transfused cohort by 100 alive claimants	18,800	22,200
Increase transfused cohort by 100 post 1999 HCV related deaths	34,300	34,500
Increase transfused cohort by 100 post 1999 non-HCV related deaths	7,100	7,100
Increase haemophiliac cohort by 100 alive claimants	30,000	34,400
Increase haemophiliac cohort by 100 post 1999 HCV related deaths	44,700	45,300
Increase haemophiliac cohort by 100 post 1999 non-HCV related deaths	10,000	10,000
Increase transition probabilities between disease stages to 110% of the baseline rates. (For example, if the baseline transition probability is 7.0%, this would increase it to 7.7%)	6,013	8,842
Decrease treatment efficacy to 90% of the assumed rates	29,298	25,507
Remove all private insurance coverage for drug costs – so the Fund pays the full cost of all drugs	35,559	47,918
Increase drug cost to $100,000 ($130,000 for provision for adverse deviations) - with an average of 40% of that paid by private insurance for claimants under age 65	26,570	28,492
Decrease recovery from disability to 50% of the assumed rates	4,946	2,829
Excess HCV Mortality remains unchanged after clearing the virus	37,999	36,682
Increase the interest rate by 1% [9]	$63,888	$86,633

[8] A decrease to the indicated assumption will have approximately the same effect but in the opposite direction.

[9] An increase in the interest rate would likely be due to an increase in the future expected returns on the assets. In that situation, there would be an approximately offsetting loss from investments.

201. In this sensitivity analysis, each line shows the effect of making only the indicated change to the single assumption. All other assumptions are held constant. The assumption changes shown in the table are not cumulative. For example, the first line shows the effect of changing only the size of the alive transfused cohort. In the second line, the size of the alive transfused cohort is returned to the starting size and then the deaths due to HCV size is changed.

202. The sensitivity results may be adjusted for a different size of change than that indicated. For example, if there is an increase (decrease) of 20 alive transfused members, the financial effect would be determined by taking 20 divided by 100 and multiplied by the sensitivity amount of $18,800,000. That would be an increase of $3,760,000 (or a decrease of the same amount).

203. It should be noted that multiple changes may be interdependent. That is, when multiple changes are combined, the total effect may be different from what one gets by adding the individual amounts together. This effect is similar to the difference between simple and compound interest. Some of the multiple assumptions changes have a compounding effect.

10. PROJECTED CASH FLOW OF COMPENSATION BENEFITS

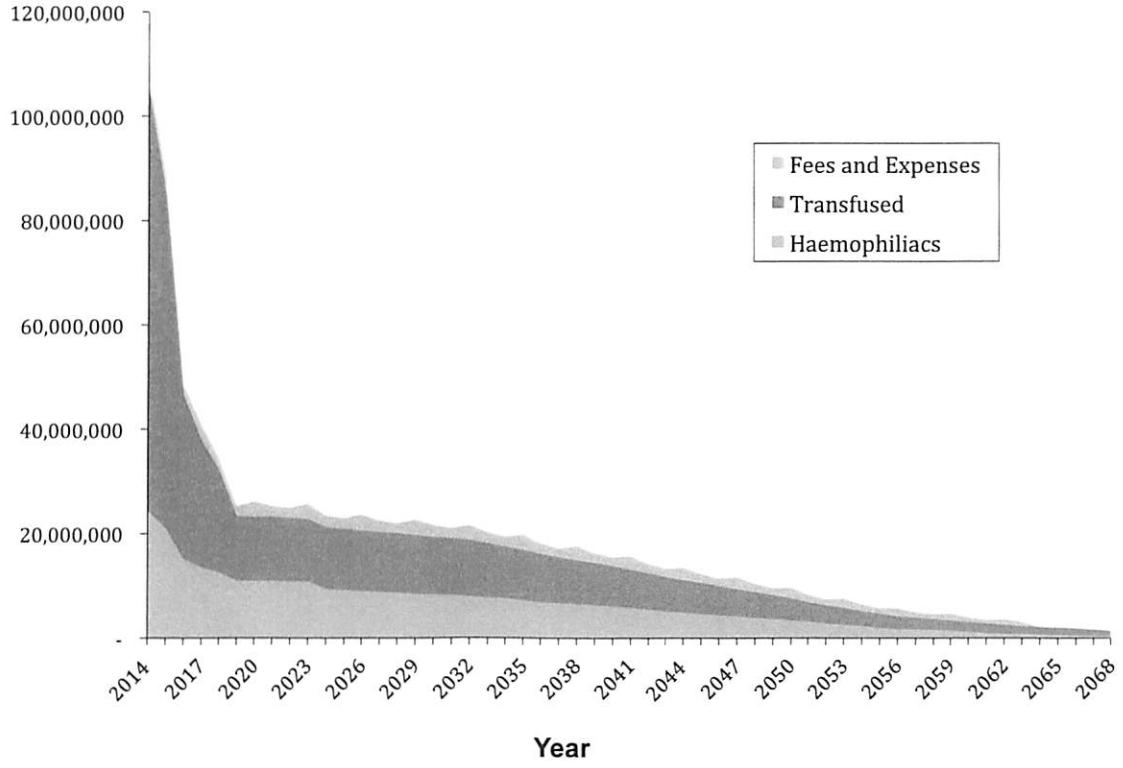
In This Section....

- We show the projected future payments from the Plan (based on the assumptions) in each of the next 90 years.

204. The following chart shows the future expected cash flows for 2014 to 2102 based on the best estimate assumptions. These are the benefit payments and expenses that underlie the liabilities for the Plan.

205. There is a large expected total to be paid from 2014 to 2018 due to the cost of treatment assumed to be given during that period.

Chart 205 – Future Cash Flows – Best Estimate Assumptions (in '000's)



206. The dollar amounts of the past and future cash flows are shown in Table 206a for the best estimate assumptions and in Table 206b for the provision for adverse deviations assumptions.

*Table 206a – Fund Cash Flows (Historical & Projected to 2102) – Best Estimate Assumptions (in '000s)**

Year	Transfused	Haemophiliacs	Fees & Expenses	Total
2000	$ 111,733	$ 20,696	$ 13,939	$ 146,368
2001	92,788	41,233	8,743	142,764
2002	57,694	29,503	8,282	95,479
2003	55,121	15,444	6,552	77,117
2004	339,623	23,757	5,990	369,370
2005	35,377	15,919	6,069	57,365
2006	30,996	13,794	4,396	49,186
2007	29,116	12,772	3,984	45,872
2008	26,687	19,881	2,340	48,908
2009	22,901	13,278	2,645	38,824
2010	24,467	12,793	2,824	40,084
2011	20,655	11,670	3,578	35,903
2012	17,380	11,082	1,861	30,323
2013	20,015	11,868	1,798	33,681
2013 o/s	6,390	5,521	-	11,911
2014	81,070	24,333	2,928	108,331
2015	63,934	21,046	3,315	88,295
2016	31,504	15,116	2,079	48,699
2017	24,360	13,606	3,018	40,984
2018	19,782	12,624	2,234	34,640
2019	12,531	10,902	1,959	25,392
2020	12,427	10,908	2,966	26,301
2021	12,322	10,925	2,187	25,434
2022	12,199	10,853	1,961	25,013
2023	12,018	10,779	3,123	25,920
2024	11,830	9,333	2,317	23,480
2025	11,673	9,236	2,096	23,005
2026	11,553	8,987	3,240	23,780
2027	11,395	8,881	2,328	22,604
2028	11,275	8,787	2,042	22,104
2029	11,145	8,555	3,147	22,847
2030	11,001	8,381	2,254	21,636
2031	10,819	8,214	1,971	21,004
2032	10,638	8,060	3,026	21,724
2033	10,292	7,801	2,159	20,252
2031 - 2102	163,591	121,161	49,821	334,573
Total	**$1,448,302**	**$607,699**	**$173,172**	**$2,229,173**

** Amounts may not add due to rounding.*

*** Cash flows include future expected inflation and are not discounted for future interest earnings.*

*Table 206b - Fund Cash Flows (Historical & Projected to 2102) – Provision for Adverse Deviations (in '000s)**

Year	Transfused	Haemophiliacs	Fees & Expenses	Total
2000	$ 111,733	$ 20,696	$ 13,939	$ 146,368
2001	92,788	41,233	8,743	142,764
2002	57,694	29,503	8,282	95,479
2003	55,121	15,444	6,552	77,117
2004	339,623	23,757	5,990	369,370
2005	35,377	15,919	6,069	57,365
2006	30,996	13,794	4,396	49,186
2007	29,116	12,772	3,984	45,872
2008	26,687	19,881	2,340	48,908
2009	22,901	13,278	2,645	38,824
2010	24,467	12,793	2,824	40,084
2011	20,655	11,670	3,578	35,903
2012	17,380	11,082	1,861	30,323
2013	20,015	11,868	1,798	33,681
2013 o/s	6,390	5,521	-	11,911
2014	97,095	28,143	2,928	128,166
2015	74,620	23,831	3,315	101,766
2016	39,014	17,285	2,079	58,378
2017	29,942	15,410	3,018	48,370
2018	24,216	14,215	2,234	40,665
2019	14,783	11,938	1,959	28,680
2020	14,812	12,009	2,966	29,787
2021	14,833	12,091	2,187	29,111
2022	14,828	12,074	1,961	28,863
2023	14,756	12,050	3,123	29,929
2024	14,661	10,646	2,317	27,624
2025	14,595	10,580	2,096	27,271
2026	14,552	10,353	3,240	28,145
2027	14,455	10,271	2,328	27,054
2028	14,396	10,195	2,042	26,633
2029	14,315	9,975	3,147	27,437
2030	14,208	9,801	2,254	26,263
2031	14,051	9,642	1,971	25,664
2032	13,883	9,484	3,026	26,393
2034	13,547	9,207	2,159	24,913
2031 - 2102	233,929	147,111	49,821	430,861
Total	**$1,606,434**	**$ 665,522**	**$ 173,172**	**$2,445,128**

** Amounts may not add due to rounding.*

*** Cash flows include future expected inflation and are not discounted for future interest earnings.*

11. ACTUARIAL ASSUMPTIONS

In This Section....

We discuss the actuarial assumptions used in this valuation and compare them to those used by Eckler Partners

- Mortality
- Interest and Inflation
- Benefit specific assumptions

Cohort and disease progression assumptions are discussed in Sections 5 and 6.

207. For this valuation, we were instructed to work cooperatively with Eckler to select the actuarial methods and assumptions jointly with the intent that we would both use the same assumptions in our respective valuations. If we were unable to agree with respect to an assumption, the reasons therefor and financial effect were to be disclosed.

208. We cooperated with the analysis of the data and shared our respective findings. Both actuaries accept all of the assumptions used in this valuation – there are no differences.

209. The assumptions about disease progression are discussed in Section 5. The assumptions about the claimant cohort are discussed in Section 6.

210. This section discusses all of the other actuarial assumptions used for this report along with reasons for their adoption.

211. These assumptions are summarized in Appendix D.

212. The liability including a provision for adverse deviations was determined using the best estimate assumptions together with a margin to provide for possible adverse deviations. We included a margin only for those assumptions that in our opinion might have a material financial effect if actual experience differed from the best estimate assumption. As a result, many of the provision for adverse deviation assumptions are the same as the best estimate assumptions.

The Valuation Models

213. We also worked together to review our respective valuation models and identify any differences. A number of such differences were found and the models adjusted to handle the calculations in a similar manner.

214. However, our models approach the calculation of liabilities from very different perspectives.

a. The Morneau Shepell valuation model is deterministic. The probabilities are applied to each claimant and the many possible journeys through the disease stages for each claimant is determined. A deterministic model is one in which the assumptions are applied exactly as stated in each year without any random variation. If a deterministic model is used to calculate the number of heads that will occur if a coin is tossed 1,000 times, the result will be exactly 500.

b. The Eckler valuation model is stochastic. In a stochastic model, each probability has a distribution – this could be equated to a bell curve that was sometimes applied to test marks in

high school. Stochastic models recognise that when things happen according to a probability, there is a degree of randomness in the results. If a stochastic model is used to calculate the number of heads that will occur if a coin is tossed 1,000 times, the result will likely be something close to 500, say between 400 and 600 in most cases. But the result could be as low as 0 and as high as 1,000, although the likelihood of that happening is minute.

215. Because our models are based on different methodologies, complete equivalency of the results is not possible, but we are satisfied that there are no material differences in the approach to calculating liabilities.

MORTALITY ASSUMPTIONS

216. ***Table 216 - Mortality Assumptions***

Assumption	2010 With Provision for Adverse Deviation	2013 Best Estimate	2013 With Provision for Adverse Deviation
Mortality from all causes other than HCV[10]			
- Transfused claimants	Canada Life Tables - 2000 to 2002	Canada Life Tables - 2009 to 2011	Same
- Haemophiliac claimants	175% of Canada Life Tables - 2000 to 2002	Canada Life Tables - 2009 to 2011	
Mortality from all causes other than HCV for those co-infected with HIV	624% of the Canada Life Tables 2000-2002	624% of the Canada Life Tables 2009-2011	Same
Mortality due to HCV from Level 6 – Decompensation	18.6%	Greater of Canada Life mortality* and 15.2%	Same
Mortality due to HCV from Level 6 – HCC (cancer)	35.0%	Greater of Canada Life mortality *and 18.2%	Same
Mortality due to HCV from Level 6 - liver transplant		Greater of Canada Life mortality* and:	
- first year	14.6%	8.6%	Same
- thereafter	4.4%	3.9%	
Unisex ratio			
- Transfused Cohort	Based on claimant's gender. Where gender not stated, 48.8% male.	Based on claimant's gender. Where gender not stated, 49.2% male.	Same
- Haemophiliac Cohort	Based on claimant's gender. Where gender not stated, 85.0% male.	Based on claimant's gender. Where gender not stated, 84.7% male.	Same

* The Canada Life mortality utilized includes the 624% adjustment for co-infected persons.

[10] The deaths resulting from this assumption are split between HCV-related and non-HCV related death based on the Excess HCV Related Mortality assumption.

217. In past valuations, we adjusted the mortality rates applied to haemophiliacs from 100% to 175% of the Canada Life Table mortality. That recognized that haemophiliacs experience greater mortality than the average Canadian[11]. That mortality assumption differed from what was used in the MMWG Report.

218. The 2013 MMWG Report states that no adjustment is made to the Canada Life mortality rates "because current care has made virus-free hemophilics almost have the same life expectancy as general population" (page 32). For the 2013 valuation, we have therefore ceased making an adjustment and apply standard Canadian population mortality rates for haemophiliacs.

219. The 2013 MMWG model changed the application of mortality at level 6. In previous models, both the stage specific mortality and the Canada Life tables were applied independently. For 2013, all level 6 deaths are considered to be as a result of HCV and the mortality rate is the greater of the stage specific rate and the Canada Life rate.

220. The determination of expected HCV related deaths is performed in three steps. First, expected deaths from all causes other than HCV is determined based on the Canada Life Mortality Tables. That gives the number of expected non-HCV deaths predicted by the MMWG model. Second, the percentages from Table 220 – Excess HCV Mortality are applied to allocate a portion of those expected deaths to be treated as HCV related deaths. Third, the HCV related deaths as expected by the MMWG model are determined, using the mortality from HCV as set out in Table 216, and added to the excess HCV related deaths.

Table 220 – Excess HCV-Related Mortality

	Disease Level						
	1	2	3	4	5	6	Expected Average
Claimants who have not cleared the virus							
HCV Death	0%	10%	35%	45%	80%	100%	33%
Non-HCV Death	100%	90%	65%	55%	20%	0%	67%
Claimants who have cleared the virus							
HCV Death	0%	0%	0%	25%	60%	100%	22%
Non-HCV Death	100%	100%	100%	75%	40%	0%	78%

The assumptions for best estimate and provision for adverse deviations are the same.

11 "Brackenridge's Medical Selection of Life Risks", Fifth Edition, May 2006, editors Dr. R. D. C. Brackenridge, Dr. Richard S. Croxon, and Dr. Ross MacKenzie. ISBN: 1403906769 , (a reference book for use in determining the average effect of various medical conditions on future mortality)

This assumption is a change from 2010. No excess HCV related mortality was assumed for claimants who had cleared the virus. For those who had not cleared the virus, the best estimate assumption was marginally higher than the above and between 10% and 20% higher for the provision for adverse deviations. The 2010 assumption is included in Appendix D.

ECONOMIC ASSUMPTIONS

221. The return on invested assets shown is developed from an expected return for a pool of assets invested in a combination of equities and bonds, less a provision for investment expenses. We have assumed the long term fund assets will be invested based on the investment benchmark mix. The long-term assets make up about 94.5% of the invested assets. The short-term fund assets (which are to be managed to be about $65 million, or 5.5% of the current fund size) are invested entirely in cash. Investment related expenses are assumed to be 0.04% of the invested assets, based on actual recent experience.

222. The provincial notional assets are assumed to earn interest at the return over the long-term future for 3 month Treasury Bills.

223. The methodology utilised by Morneau Shepell and by Eckler to determine the discount rates differ, but the resulting best estimate and provision for adverse deviations rates are the same.

224. *Table 224 - Economic Assumptions*

	2010			2013		
Asset Class	**Allocation**	**Expected Return**	**Contribution to Fund Return**	**Allocation**	**Expected Return**	**Contribution to Fund Return**
Universe Bonds	3.7%	2.90%	0.11%	5.0%	4.10%	0.21%
Short Term Bonds	6.9%	2.50%	0.17%	6.7%	4.10%	0.27%
Real return bonds	66.0%	3.35%	2.21%	64.0%	2.90%	1.86%
Equities						
- Canada	4.3%	7.50%	0.32%	5.7%	7.60%	0.43%
- US	1.5%	7.50%	0.11%	2.8%	7.60%	0.21%
- International	1.7%	7.50%	0.13%	2.8%	7.60%	0.21%
Notional assets	15.9%	2.50%	0.40%	13.0%	3.10%	0.40%
Expected return	100.0%		3.45%	100.0%		3.60%
Rebalancing effect			0.12%			0.24%
Less Inflation			-2.25%			-2.50%
Less Expenses			-0.04%			-0.04%
Discount rate - Best Estimate			**1.28%**			**1.30%**
Margin for Adverse Deviations			-0.23%			-0.25%
Discount Rate - PfAD			**1.05%**			**1.05%**

ASSUMPTIONS FOR SPECIFIC BENEFIT PAYMENTS

225. We need to make assumptions about each specific benefit available under the Plan. Except where indicated otherwise, each of the following assumptions is used for both the best estimate and the provision for adverse deviations.

226. Most of the payment amounts are increased from the 1999 levels as set out in the Settlement Agreement to reflect inflation. This indexing is based on the indexing level under the Canada Pension Plan each year. In the discussion of benefit amounts, we refer to the amount based on the 1999 levels. In the valuation, we recognised the actual indexing that has been applied up to January 2014.

227. The following are the indexing rates that have been used to increase the payments under the Plan. The rates for 2005 to 2007 were taken from the 2007 Eckler Report. For 2014 and thereafter, payments are assumed to be indexed at the rate of inflation. These historical indexing rates are based on fact and are the same for all sets of assumptions.

Table 227 – Historical Indexing Rates

Year	Indexing Rate
1999	1.57%
2000	2.54
2001	3.01
2002	1.63
2003	3.21
2004	1.72
2005	2.26
2006	2.13
2007	1.91
2008	2.52
2009	0.35
2010	1.66
2011	2.84
2012	1.76
2013	0.91

228. The cumulative indexing rate since 1999 is 34.5774%. So the $10,000 lump sum payable for level 1 would be paid at $13,457.74 during 2014.

$10,000 for HCV infection (Level 1)

229. Payments are assumed to be made immediately upon a claimant being approved. All known claimants are therefore assumed to have received this amount. To the extent that any amounts remain outstanding, they are included in the total of outstanding payments.

230. For the unknown claimants, payments are assumed to be made at future dates upon approval of their claim without regard to their disease stage. Refer to the discussion of the Claimant Cohort for further details.

$20,000 - positive PCR test (Level 2)

231. Payments are assumed to be made immediately upon a claimant reaching level 2. Since there is an assumption that no person will progress from level 1 to any other level, this essentially results in a payment immediately upon a claim being approved for those at level 2 or beyond. All known claimants other than those at level 1 are therefore assumed to have been paid this amount. To the extent that any amounts remain outstanding, they are included in the total of outstanding payments.

232. For the unknown claimants, payments are assumed to be made upon approval of their claim if they are level 2 (disease stage F0(RNA+)) or beyond.

$30,000 - Non-bridging fibrosis (Level 3)

233. This payment is available to all claimants who have developed non-bridging fibrosis or have proceeded beyond that level. The MMWG model does not include a stage directly corresponding to non-bridging fibrosis. However, we understand that non-bridging fibrosis normally occurs somewhere between stages F1 and F2, (Fibrosis stages 1 and 2) and we have assumed that a claimant at stage F1 is entitled to level 3 benefits. This is consistent with the Eckler assumptions and with how the MMWG assumed the levels and stages would be treated.

234. A claimant may elect to waive this payment and receive instead a Loss of Income or Loss of Services benefit. The decision as to which benefit to receive may be deferred as long as the claimant wishes.

235. For all known claimants who have made an election to receive the $30,000 lump sum, we have assumed payment has been made and to the extent that it has not, the amount is included in the outstanding payments totals.

236. For all unknown claimants and all known claimants who have not made an election or have not reached this stage, we assumed 95% of those under age 65 and 93% of those over age 65 would elect to receive the $30,000 lump sum and the balance would elect the Loss of Income or Loss of Services benefit as described in the following section.

$65,000 - Cirrhosis (Level 5)

237. Payments are assumed to be made immediately upon a claimant reaching Level 5 (stage F4 - Cirrhosis). All known claimants at stage F4 and beyond are assumed to have been paid this amount. To the extent that any amounts remain outstanding, they are included in the total of outstanding payments.

238. For other claimants, payments are assumed to be made upon transition to stage F4.

$100,000 – Decompensation/Cancer/Liver Transplant (Level 6)

239. Payments are assumed to be made immediately upon a claimant reaching level 6 – liver decompensation and HCC. (While liver transplant is recognised under the Plan, the medical model assumes that all patients who receive a liver transplant first go through the liver decompensation stage, so for purposes of this valuation, no additional benefits are assumed payable at liver transplant). All known claimants at stages decompensation or HCC and beyond are assumed to have been paid this amount. To the extent that any amounts remain outstanding, they are included in the total of outstanding payments.

240. For other claimants, payments are assumed to be made upon transition to stages decompensation or HCC.

Loss of Income and Loss of Services at Non-Bridging Fibrosis Stage (Level 3)

241. Loss of income is available to claimants under age 65 who have non-bridging fibrosis (assumed to occur as described above) and have elected to receive a Loss of Income benefit in lieu of the $30,000 lump sum.

242. For the best estimate as well as the provision for adverse deviations values, known claimants who are already in receipt of this benefit are assumed to continue to receive payments in the same amount but indexed each year.

243. For other claimants who have not made an election regarding the $30,000 payment, (both known and unknown claimants), 5% of those under age 65 and 7% of those over 65 are assumed to waive entitlement to the $30,000 lump sum amount. Of those under age 65, 60% of this 5% (or 3% of those at non-bridging fibrosis stage) are assumed to receive a Loss of Income benefit. At age 65, they will switch to a Loss of Services benefit. The rest of those who waive the $30,000 benefit (2% of those under age 65 and 7% of those over age 65) are assumed to receive a Loss of Services benefit. For the 2010 valuation, the assumptions were the same with the exception that the 7% and 93% values were 5% and 95% respectively.

244. Loss of Income benefits are assumed to be $39,000 ($35,000 in 2010 valuation) per year for the transfused cohort and $48,000 ($38,000 in 2010 valuation) per year for the haemophiliac cohort. Loss of Services benefits are assumed to be $16,000 ($15,000 in 2010) per year for both the transfused and haemophiliac cohorts. These dollar amounts are all in 2014 dollars.

Loss of Income and Loss of Services at Bridging Fibrosis Stage and Beyond (Levels 4 to 6)

245. Entitlement to these benefits is described in Appendix A - Summary of Benefits. Loss of Income is available to claimants under age 65. Loss of Services is available to any claimant regardless of age, provided they are not in receipt of a Loss of Income benefit.

246. For the best estimate as well as the provision for adverse deviations values, known claimants who are already in receipt of these benefits are assumed to continue to receive payments at the same level but indexed each year.

247. For the known claimants who are at or beyond bridging fibrosis (levels 4 to 6) and who are not currently in receipt of this benefit, we have assumed that there may be a future claim in accordance with the following tables. The percentage for future claims from known claimants when added to the respective percentage of known claimants who are already receiving a benefit gives a total the same as (or in some cases greater than) the unknown claimants.

Table 247 – Rate of Future Claims for Loss of Income/Services Benefit

Benefit Payment	2010	2013 - BE	2013 - PfAD
Loss of Income – Level 3			
▪ Proportion claiming	3% elect under age 65 0% elect over age 64	3% elect under age 65 0% elect over age 64	Same
Loss of Services – Level 3			
▪ Proportion claiming	2% elect under age 65 5% elect over age 64	2% elect under age 65 7% elect over age 64	Same
Loss of Income – Levels 4 and 5			
▪ Proportion claiming – unknown	18% under age 65 0% over age 64	21% under age 65 0% over age 64	Same
▪ Proportion claiming - known[12]	7% transfused 0% haemophiliac	5.8% transfused 3.2% haemophiliac	
Loss of Income – Level 6			
▪ Proportion claiming - unknown	17% under age 65 0% over age 64	25% under age 65 0% over age 64	Same
▪ Proportion claiming - known	0% transfused 0% haemophiliac	0% transfused 0% haemophiliac	
Loss of Services – Levels 4 and 5			
▪ Proportion claiming - unknown	39% under age 65 57% over age 64	30% under age 65 51% over age 64	Same
▪ Proportion claiming - known			
- Transfused	11% under age 65 25% over age 64	6.7% under age 65 27.3% over age 64	
- Haemophiliac	5% under age 65 0% over age 64	0% under age 65 0% over age 64	

12 The known proportion claiming applies to known claimants already at the indicated level who have not yet commenced a claim. All known claimants already on claim are assumed to continue. All known claimants who later transition into the level are assumed to claim based on the proportions for unknown claimants.

Benefit Payment	2010	2013 - BE	2013 - PfAD
Loss of Services – Level 6			
▪ Proportion claiming - unknown	57% under age 65 74% over age 64	40% under age 65 65% over age 64	Same
▪ Proportion claiming - known			
- Transfused	25% under age 65 18% over age 64	5.3% under age 65 40.9% over age 64	
- Haemophiliac	10% under age 65 0% over age 64	0% under age 65 0% over age 64	

248. Payments are assumed to continue for the lifetime of the claimant.

249. The valuation model assumes that those who claim a Loss of Income or Loss of Services benefit do so coincident with transitioning into level 4. (For the increase from 51% to 65% of claimants at level 6, the extra 14% are assumed to claim coincident with their transition to level 6). In reality, many of these claims will commence at a later time. This assumption will overstate the liabilities. This issue only affects the claimants who transition to level 4 without having claimed at an earlier level. We will refer to this group as Knowns with Deferred Benefits.

250. Under the Plan, a claimant at level 4 who has a Loss of Income or Services that commenced prior to reaching level 4 may claim retroactive benefits – even if they had received the $30,000 lump sum payment at level 3. This may affect a small percentage of the claimants who transition to level 4. We will refer to this group as Knowns with Retroactive Benefits.

251. When an unknown claimant at level 4 or beyond files a claim, there may be a Loss of Income or Loss of Services that commenced prior to the filing of the claim. Such a loss is eligible for payment. We will refer to this group as Unknowns with Retroactive Benefits.

252. In our opinion, the overstatement of liabilities for the Knowns with Deferred Benefits is significantly greater than the liability for the Knowns and Unknowns with Retroactive Benefits. We have therefore assumed that the liability for Knowns with Deferred Benefits will exceed the total liability for Knowns with Retroactive Benefits and Unknowns with Retroactive Benefits. Rather than trying to quantify the amounts involved, for the best estimate and provision for adverse deviations assumptions, we have assumed there is no adjustment required to recognize the retroactive benefits payable and that there may be an immaterial overstatement of liabilities as a result.

253. Further, in our opinion, it is likely that any claims commenced at level 6 will have no or very little retroactive payments due.

254. We understand that there may be situations where claimants are receiving Loss of Income or Loss of Service benefits due to a temporary disability. The data does not identify these claimants, so we have assumed that there are no temporary periods of disability. To the extent that some of these

claimants will recover and, either permanently or temporarily, cease receiving Loss of Income or Services benefits, the liability will be overstated slightly.

255. For claimants currently receiving benefits, the amount paid is assumed to continue with indexing for the future. For claimants not currently receiving this benefit, the Loss of Income payments are assumed to be $39,000 ($35,000 in 2010) per year for the transfused cohort and $48,000 ($38,000 in 2010) per year for the haemophiliac cohort. Loss of Services benefits are assumed to be $16,000 ($15,000 in 2010) per year for both the transfused and haemophiliac cohorts. These dollar amounts are all in 2014 dollars.

Recovery from Loss of Income and Loss of Services

256. Prior to 2013, we assumed that any claimant who commenced a Loss of Income or Loss of Services benefit would remain in receipt of it (after switching to a loss of services benefit at age 65) for the balance of their life. While there were claimants for whom the disability was temporary, they were few in number and ignoring the possibility of recovery from disability is not material.

257. With the new treatments available, we believe that recovery from disability will be material and we have therefore made an assumption. We had little information on which to base the assumption. We were advised that:

    a. damage done by HCV is not reversed by recovery;

    b. comorbidity issues will likely continue and any prior effect of HCV on the comorbidity could continue affecting the person for some time; and

    c. recovery time for most claimants at level 3 is likely to be a few months but increase to a few years, if at all, at level 5.

258. Based on the above, we assume that the following percent of claimants who have cleared the virus and those who will clear the virus will recover and have their loss of income and loss of services benefit cease.

Table 258 - Recovery Rates from Loss of Income and Loss of Services After Clearing the Virus

Duration Since Disability	Levels 3 & 4	Level 5	Level 6
1	50.0%	25.0%	0%
2	30.0%	15.0%	0%
3	25.0%	12.5%	0%
4	25.0%	12.5%	0%
5	15.0%	7.5%	0%
6	10.0%	5.0%	0%
7	5.0%	2.5%	0%
8	5.0%	2.5%	0%
9+	0.0%	0.0%	0%

Costs of Care (Level 6)

259. Table 259 shows the past six years of claims for cost of care among all claimants at level 6.

Table 259 – Cost of Care Claims

Year	Number Claiming Cost of Care	Percentage of All Level 6 Claimants	Average Claim Amount
2008	48	38.7%	$ 21,236
2009	53	39.3%	25,665
2010	52	37.7%	28,835
2011	56	40.3%	26,966
2012	50	37.3%	36,501
2013	53	38.4%	47,914
Average	52	38.6%	$ 31,261

260. In our discussions with Eckler about assumptions, we assumed that the large increase in average amount for 2013 is likely a statistical anomaly, but decided to reflect it as an assumption for the provision for adverse deviation.

261. Each year on average, 40% (45% in 2010) of claimants at level 6 (decompensation, HCC and liver transplant) will require care with an average claim of $30,000 ($16,000 in 2010) where the amount is stated in 2014 dollars. For the provision for adverse deviations, the assumptions are 40% (55% in 2010) at an average claim of $45,000 ($21,000 in 2010).

Drug Therapy

262. With the new drug treatment regimens recently introduced and expected to be introduced in the near future, the claims for drug therapy benefits will likely change significantly from the past. The new treatments are expected to take less time and be much less debilitating during treatment. In our discussions with Eckler, we decided that past treatment statistics would be of little or no use in making an assumption for the future.

263. Based on information provided by two medical doctors[13] together with recommended treatment protocols provided by Sharon Matthews of the Joint Committee and information on the prevalence of various genotypes in Canada[14], we developed an average treatment length for use in our models. The information indicated that the vast majority of claimants will require 12 weeks of treatment, but there are some who will only require 8 weeks and others up to 24 weeks. On average, treatment length is expected to be about 13.2 weeks. For the best estimate assumption, we assume a treatment length of 13.2 weeks (3.3 months) and for the provision for adverse deviations, we assume an average treatment length of 14.5 weeks (3.6 months). The benefit amount is $1,000 (1999 dollars) payable for each month.

264. We have therefore assumed for the best estimate that 100% of claimants will receive a drug therapy benefit of $3,300 (1999 dollars) coincident with receiving a treatment (see Table 79 for the treatment assumptions). For the provision for adverse deviations, we have assumed an average benefit of $3,600.

265. For 2010, we assumed that 60% of level 3 claimants, 70% of level 4 claimants and 80% of level 5 claimants would receive one payment per level of $11,000 (in 1999 dollars).

Uninsured Treatment & Medication

266. With the new treatments recently available and expectations for additional treatments to become available, we expect the costs for uninsured treatment and medication will change significantly from what has been experienced in the past. We therefore requested the administrator to separate all past claims for uninsured treatment and medication between costs for treatment aimed at clearing the virus and costs for all other types of treatment.

267. We have assumed that treatment costs for purposes other than clearing the virus will continue for the future among those who have not cleared the virus in similar proportions to the past. We have

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13 Dr. Wong (retained by the Department of Justice) and Dr. Bain (retained by the Joint Committee).

14 "Distribution of Hepatitis C Virus Genotypes in Canada: Results form the LCDC Dentinel Health Unit Surveillance System"; RK Chaudhary, PhD, M Tepper MD, S Eisaadany, Paul R Gully MD; Canadian Journal of infectious Diseases, Vol 10, No 1 January/February 1999.

assumed that treatment costs for purposes of clearing the virus will be significantly different from the past and we developed an assumption based on expected costs for the new drugs.

268. Table 268 shows the percentage of known claimants who have been reimbursed at any time in the past nine years for uninsured treatment where the costs were not directly incurred for purposes of clearing the virus. The average claim over the last 3 and 6 years includes an adjustment for inflation to 2014 dollars.

Table 268 – Known Claimants with Uninsured Treatment Claims not Related to Clearing the Virus

Year	Transfused		Haemophiliac	
	Percent Claiming	Average Claim	Percent Claiming	Average Claim
2005	5.1%	$ 1,014	6.2%	$ 2,330
2006	4.7%	1,559	8.2%	2,189
2007	4.4%	1,290	7.3%	2,357
2008	4.8%	1,213	6.9%	2,101
2009	4.5%	1,197	7.2%	2,443
2010	4.0%	1,142	6.9%	2,011
2011	4.0%	1,067	7.0%	3,329
2012	3.6%	1,448	6.6%	3,728
2013	4.3%	1,162	8.1%	2,562
Average - Last 3 Years	4.0%	$ 1,249	7.2%	$ 3,253
Average - Last 6 Years	4.2%	$ 1,250	7.1%	$ 2,790

269. We are concerned that claimants who incur expenses not related to clearing the virus may have a greater likelihood of being among the claimants who do not receive future treatment or do not clear the virus. (It is also possible that the opposite may be the case). To allow for this possibility, we have allowed for an increase in the incidence rate and average claim amount.

270. For our best estimate assumptions, we have assumed that each year 4.5% of transfused claimants will incur an expense on average of $1,500 and that 7.5% of haemophiliacs will incur an expense of $3,500 in 2014 dollars. The provision for adverse deviations assumption is the same.

271. The above uninsured treatment cost assumptions are applied in each future year to all alive claimants who have not cleared the virus.

272. In addition, we need to recognise that there will be future claims for drug treatments for purposes of clearing the virus. To date, we have only limited data on the cost of the new drug treatments. On average, triple therapy costs are totalling about $55,000 per 12-week treatment, and Sofosbuvir doublets (trade name Harvoni) are costing about $78,000 per treatment. There is no cost data for 3D regimen nor for Sofosbuvir doublets with Daclatsavir. We anticipate that there may be other drugs under development that could be introduced in the future.

273. We have assumed that the cost per treatment of the drugs to be introduced in the future will need to be priced similarly to Harvoni in order to capture market share.

274. For the best estimate assumption, we have assumed that treatment will be given as set out in the MMWG Report and will take an average treatment of 13.2 weeks (3.3 months). For the provision for adverse deviations, we assume that the new drugs will become predominant and treatment with Triple Therapy will largely disappear. We also assume that for provision for adverse deviations the average treatment length will be 14.5 weeks (3.6 months) and that the cost of the drugs will increase by about 15% from the present costs. This results in the following costs per treatment.

Table 274 – Cost of Drugs per Treatment

Treatment	Best Estimate	Provision for Adverse Deviations
PEG-IFN/RBV-based Triple Therapy	$ 60,000	$ 110,000
Sofosbuvir-based Doublet	85,000	110,000
3D Regimen plus RBV	85,000	110,000

275. For greater certainty, the drug costs for purposes of clearing the virus are incurred only once per claimant in conjunction with the treatment rates set out in Table 79.

276. The cost of drug treatment may be covered by provincial health insurance programs or by private insurance plans, such as are often available through employment. The Fund reimburses the costs net of any amounts payable by a province or health insurance.

277. Provincial drug programs work on the basis of a formulary, or a list of drugs that are eligible for reimbursement. It can take many months following approval of a drug by Health Canada for the provinces to review it and to determine whether to add it to their formulary. Even though a drug may be on the formulary, there may be restrictions to the situations in which it will be covered by the drug program.

278. As of the date of the report, none of the drugs used in Sofosbuvir based doublets or 3D regimen has been approved by any province. We therefore have assumed that for the time-period during which the claimants are assumed to receive treatment, there will be no provincial reimbursement available for any of the drugs used.

279. Private insurance coverage is most likely to be available for claimants who are employed. About 75% of the working-age population is employed. These plans generally provide reimbursement of between 80% and 100% of the cost of drugs. Since not all employed persons are members of a drug plan and not all drug plans will automatically cover these HCV drugs, we have assumed that on average 80% of the cost of the drugs will be reimbursed for two-thirds of the 75% of claimants assumed to be working. That gives an average reimbursement of 40% per claimant under age 65 and no reimbursement for claimants over age 65.

280. Following the finalisation of our valuation results we became aware that Abbvie received Health Canada approval on 23 December 2014 for Holkira Pak, a 3D-regimin drug. We understand the price of the drug is about $56,000 for a 12-week treatment plus the cost of ribavirin, if used. (We have not been able to determine whether that is a retail or wholesale price.) For the valuation, we assumed that the price for treatment would be similar to Harvoni, at about $85,000 based on an average of 13.2-weeks for treatment.

281. The price of Holkira Pak may lead to a reduction in the price of Harvoni and possibly other HCV drugs.

282. It may be that the cost of drugs will be less than assumed in the valuation and that will result in experience gains. We have not reflected this possibility in this report. If the prices of the drugs are lower than assumed, the gains will be reflected in the next sufficiency review.

283. In 2010, we assumed a best estimate assumption of 4% of claimants at disease levels 3 to 6 would incur an expense each year on average of $3,000 for transfused claimants and that 6.5% of haemophiliacs at levels 3 to 6 would incur an expense of $4,000 in 2011 dollars. Over a five-year period, that would result in about 19% of claimants having incurred an expense, and over 10 years, it would be about 34%.

Out-of-pocket Expenses

284. With the large number of claimants expected to clear the virus during the coming five years from the new treatment regimens available, we separated the out-of-pocket expenses to an assumption that applies to those who have not cleared the virus and those who have cleared the virus.

285. Having reviewed the administrator's payment protocol for this expense, it seems that very few claimants at level 1 would be likely to incur more than one out-of-pocket expense, as they have cleared the virus. As well, claimants who live in large metropolitan areas and are in close proximity to health facilities should have no or very little expenses. However, for simplicity in implementing this benefit in the valuation models, we decided to make an assumption about the average incidence and average amount of claims each year across all claimants.

286. The following tables show the past incidence and amounts of out-of-pocket expenses for the known claimants. All amounts have been adjusted to the equivalent 2014 dollars. Each reimbursement is treated as a separate claim.

Table 286 – Average Amount of Out-of-Pocket Expenses by Year

	Transfused		Haemophiliac	
Year of Claim	Percent with a Claim	Average Claim	Percent with a Claim	Average Claim
2001	22.7%	1,557	24%	1,682
2002	9.7%	1,841	12%	2,231
2003	12.0%	1,698	13%	3,648
2004	9.4%	1,726	12%	2,094
2005	8.6%	1,473	13%	2,165
2006	7.4%	1,863	13%	2,826
2007	7.9%	1,859	11%	3,456
2008	6.0%	1,855	10%	1,956
2009	5.7%	1,523	11%	2,192
2010	5.2%	1,828	10%	2,451
2011	5.1%	1,546	9%	2,542
2012	4.9%	1,501	11%	1,666
2013	5.0%	1,929	11%	1,932
Total*	**901**	**$1,484**	**374**	**$2,256**

** The total number of claimants is not the sum of the number from each year, since some claimants had multiple out-of-pocket expenses.*

287. While the percentages have decreased gradually over the years to about 5.1% for transfused, 11% for haemophiliac and a weighted average of 6.3%, we decided to make an allowance for a possible increase in the future. As many claimants clear the virus, we are concerned that those who remain with HCV may be more likely to incur ongoing out of pocket expenses.

288. For our best estimate and with provision for adverse deviations assumptions, we assumed that 8% of all claimants at levels 1 to 6 who have not cleared the virus will incur an out-of-pocket expense. The average expense is assumed to be $1,800 ($1,700 for 2010) for transfused and $2,600 ($2,500 for 2010) for haemophiliac claimants, both in 2014 dollars.

289. For 2013, we have added two new assumptions about out-of-pocket expenses.

290. We assume that 100% of claimants who clear the virus will incur an out-of-pocket expense coincident with their treatment for $1,200 for transfused and $5,000 for haemophiliacs.

291. Once a claimant has cleared the virus, it is likely that there will be some follow up monitoring and that some additional out-of-pocket expenses are likely to be incurred. We analysed the out-of-

pocket expenses from all claimants who indicated that they have cleared the virus prior to 2013. While there were some claimants with expenses many years after they cleared the virus, most out-of-pocket claims ceased within a few years of clearing the virus.

Table 291 – Out-Of-Pocket Expenses Following Successful Treatment

	Transfused	Haemophiliac
Number of claimants known to have cleared the virus	218	55
Number of Out-of-Pocket claims following successful treatment	306	170
Average number of follow-up claims per person clearing the virus	1.4	3.1
Average amount of all follow-up expenses per claimant	$ 1,113	$ 4,969

292. We have assumed that once a claimant clears the virus, there will be some out-of-pocket expenses for follow-up appointments. Each successfully treated claimant is assumed to have a total out-of-pocket expense of $1,200 for transfused and $5,000 for haemophiliacs. For the provision for adverse deviations, we assume the total claim will be $2,400 for transfused and $10,000 for haemophiliacs. While these claims are likely incurred over a 2 year or longer period following treatment, for simplicity we have assumed the amount is incurred immediately following successful treatment.

Retroactive Benefits for Unknown Claimants upon Approval

293. When an unknown claimant is approved, they may have previously incurred expenses that are eligible for reimbursement. We have discussed the issue of retroactive benefits for Loss of Services and Loss of Income above. We discuss retroactive benefits payable to dependants below.

294. The other benefits that may produce a retroactive payment upon claim approval are

    a. Out-of-pocket expenses

    b. Uninsured treatment

    c. Costs of care

295. Because the data that was analysed for setting the assumptions included any retroactive claim amount for the claimants, it is our opinion that the assumed claim amounts used already reflect an amount for any retroactive claims. We have assumed that there is no need to make any additional assumptions about retroactive claims.

Secondarily Infected Persons

296. We have assumed that all secondarily infected claimants are either known claimants or are included in the unknown cohort.

$50,000 Full Settlement for Haemophiliacs with HCV and HIV

297. There is a provision for a haemophiliac who is both HCV and HIV primarily infected to claim a lump sum of $50,000 in full satisfaction of all claims.

298. Under the plan, a person at level 1 is entitled to a $10,000 payment. The MMWG Report indicates that it is unlikely that a level 1 person would advance in the disease, and the medical model ignores that remote possibility. For consistency, it makes sense to us that any co-infected haemophiliac at level 1 would most likely elect this $50,000 option rather than the $10,000 otherwise available.

299. For the best estimate and provision for adverse deviations, we have assumed that the known co-infected haemophiliacs who have made an election were paid based on the election made. For all unknown co-infected haemophiliacs, we assumed 100% at level 1 would elect this option.

HCV related death before 1 January 1999

300. There are two options available to deceased transfused claimants – a single lump sum of $120,000 plus uninsured funeral expenses or a $50,000 lump sum plus uninsured funeral expenses plus family member benefits plus dependant's annual ongoing benefits.

301. In addition to the options available to transfused claimants who die prior to 1999, haemophiliacs who are co-infected with HIV may elect a $72,000 lump sum amount without submitting evidence of infection through the blood supply in the 1986 to 1990 period. We have assumed that there will be no further election of this benefit among the unknown haemophiliac claimants (same as 2010).

302. For the best estimate and with provision for adverse deviations, we assumed that all payments presently being made to dependents will continue at the same level as present, but indexed each year. The end date for these payments is specified in the data.

303. For the unknown claimants, we assumed that 48% would elect to receive the $120,000 payment option and that 52% would elect the $50,000+ option (along with claims for dependants and family members). This is the same as for 2010.

304. Among the known transfused claimants, there are 5 who have elected the $50,000+ option but for whom total benefits paid to date are less than the $120,000 that would have been paid had the claimants selected the other option. One of those claimants received a loss of services payment in early 2014 covering past years of over $200,000. For two of the others, it looks like a further claim is likely and two look like there will be no more claims (the last claim paid was in 2004 and 2007 respectively). If all four of these claimants were to file a dependant or family claim for the amount needed to exceed $120,000 (plus indexing), the total would be about $265,000 in 2014 dollars. Including the $205,000 recently paid to the fifth claimant gives a total of $470,000. It is possible that the future claims from these five claimants could be more, but it also possible that

they could be less or no additional claims. We have therefore assumed that future claims for these five pre-1999 deaths will total $500,000.

305. Our analysis of the uninsured funeral claims indicated that only about 75% of all eligible claimants file a claim for funeral expenses and the average amount paid is $4,800 (all past payments adjusted to 2014 dollars). We noted that there is often a delay in filing a funeral claim and that the percentage of claimants for whom a claim has been filed has been increasing steadily each year. We therefore assumed that 90% of all future deaths of claimants from HCV would involve a claim for uninsured funeral expenses of an average $4,800 each.

306. For simplicity in our models, we modified that assumption to 100% of all future deaths would claim for uninsured funeral expenses of $4,300 each. (For 2010, we assumed 100% would claim a funeral expense of $5,000 each).

307. For those who elect the $50,000 plus option, we have assumed:

    a. family benefits (for loss of guidance, care and companionship) of $75,000 for transfused and $85,000 for haemophiliacs ($80,000 for both groups for 2010).

    b. All existing dependant claims are assumed to continue.

    c. For future approved claimants that are under age 65 at the date of death, we assume that 20% of transfused and 50% of haemophiliacs would elect a Loss of Support and the rest a Loss of Services (20% for both transfused and haemophiliacs for 2010). For those over age 65, all are assumed to elect a Loss of Services benefit.

    d. Loss of Support benefits for future approved claimants will average $30,000 per annum for transfuseds and $34,000 for haemophiliacs ($30,000 and $32,000 respectively for 2010), payable to age 65, with a Loss of Services thereafter.

    e. Loss of Services benefits for future approved claimants are payable for the life expectancy of the deceased claimant equal to an average of $16,000 per annum ($15,000 for 2010).

HCV related death after 1-Jan-1999

308. Where death occurs for reasons other than HCV, no benefits are payable as a result of the death. Where death is due to HCV, any uninsured funeral expenses are payable along with lump sum amounts payable to family members plus ongoing Loss of Support or Loss of Services payable to dependants.

309. For all known claimants who are deceased, we assumed that any funeral expenses and family member claims have been paid (or are included in the outstanding payments). Any Loss of Support or services benefits currently being paid will continue at the same amount, indexed for the future, and the Loss of Services payments will cease when the deceased claimant would have reached age 85.

310. For all unknown claimants and all known alive claimants who later die as a result of HCV, we assumed:

a. 100% will receive uninsured funeral expenses of $4,300 ($5,000 for 2010) in 2014 dollars.

b. 100% will receive family benefits of $50,000 ($55,000 for 2010) for transfused and $60,000 ($55,000 for 2010) for haemophiliac claimants.

c. For a death of a known claimant that occurs prior to age 65 where the claimant is in receipt as of the valuation date of:

(i) a Loss of Income benefit, then a Loss of Support benefit becomes payable to the claimant's dependants equal to 70% of the Loss of Income benefit amount, plus future indexing;

(ii) a Loss of Services benefit, then a Loss of Services benefit becomes payable to the claimant's dependants equal to $16,000, plus future indexing;

d. For a death of a known claimant where the claimant is not in receipt of a Loss of Income or a Loss of Services benefit as of the valuation date:

(i) Where the claimant was under age 65 on the date of death, 45% of dependants will receive a Loss of Support benefit of $31,000 for transfused and $33,000 for haemophiliacs payable to the claimant's age 65 and converted to a Loss of Services benefit at age 65 payable to the claimant's age 85, in 2014 dollars;

(ii) Where the claimant was under age 65 on the date of death, 5% of dependants will receive a Loss of Services benefit of $16,000 payable to the claimant's age 85, in 2014 dollars;

(iii) Where the claimant was over age 65 on the date of death, 40% of dependants will receive a Loss of Services benefit of $16,000 payable to the claimant's age 85, in 2014 dollars;

e. For a death of an unknown claimant:

(i) Where the claimant was under age 65 on the date of death, 55% of dependants will receive a Loss of Support benefit of $31,000 for transfused and $33,000 for haemophiliacs payable to the claimant's age 65 and converted to a Loss of Services benefit at age 65 payable to the claimant's age 85, in 2014 dollars;

(ii) Where the claimant was under age 65 on the date of death, 20% of dependants will receive a Loss of Services benefit of $16,000 payable to the claimant's age 85, in 2014 dollars;

(iii) Where the claimant was over age 65 on the date of death, 60% of dependants will receive a Loss of Services benefit of $16,000 payable to the claimant's age 85, in 2014 dollars;

311. The percentages for deaths that result in a Loss of Support and Loss of Services benefits (other than for the known claimants currently in receipt of a Loss of Income benefits as of the valuation date) were developed from statistics about Canadians that are in the labour force (either employed or looking for work)[15] and spousal status[16].

a. Those with a spouse and in the labour force under age 65 are assumed to receive a Loss of Support benefit.

b. Those with a spouse and not in the labour force under age 65 as well as those over age 65 with a spouse are assumed to receive a Loss of Services benefit.

c. Those without a spouse are assumed to receive neither Loss of Support nor Loss of Services.

Outstanding Payments at 31 December 2010

312. As of the valuation date there are a number of benefit payments outstanding. Based on information provided by the administrator and the Joint Committee we have determined that the outstanding payments totalled:

• Outstanding payments for transfused	$ 6,390,000
• Outstanding payments for haemophiliacs	$ 5,521,000
• Total outstanding payments	$11,911,000

HIV Secondarily Infected Claimants

313. An HCV infected person who is also a secondarily infected HIV person may only receive compensation from this Plan once their claims would otherwise have exceeded $240,000. The Joint Committee expects this group to be non-existent or very small. We therefore have assumed that there will be no such claims.

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15 Approximately 73% of Canadians under 65 (with most emphasis placed on those aged 45 to 65) are in the labour force (Statistics Canada – CANSIM 282-0002 for 2013)

16 Approximately 75% of Canadians under age 65 and 60% over age 65 have a spouse. (Statistics Canada – CANSIM 051-0042 for 2014

HIV Program

314. This Plan pays a lump sum of $240,000 to Canadians who are secondarily infected with HIV by virtue of being a partner or child of a primarily infected HIV person who is an approved Extraordinary Assistance Program recipient. A maximum of 240 such benefits are payable.

315. The Joint Committee advised that they expect to receive a total of five additional claims for $240,000 each under this provision, one in 2014 and one in each third year up to 2026. The present value of these future benefits is $950,000 for the best estimate assumption and $970,000 including provision for adverse deviations.

Fees and Expenses

316. Eckler worked with the Joint Committee to set the assumptions about future fees and expenses. We reviewed their work and have accepted it as the assumption for both best estimate and provision for adverse deviations.

317. The dollar amounts are in 2014 dollars and are subject to annual increases for inflation from 2014 to the year of payment. Various taxes (GST, HST, provincial sales tax) were averaged based on the provinces where the expenses are expected to be incurred and using current tax rates. The amounts remain approximately the same for each three year cycle through to 2025 after which they decline in approximate relation to the expected number of alive claimants.

    a. *Actuarial*: $436,000 in 2014, $540,000 in 2015, and $125,000 in 2016, plus 5% GST. After 2016, the total in each three year cycle is $925,000.

    b. *Accounting expert testimony and assistance*: $20,000 per year until 2020 and $15,000 per year thereafter, plus 13% HST.

    c. *Administration*: $740,000 in 2014, declining gradually to $600,000 for 2017 and thereafter, plus 13% HST.

    d. *Arbitrators/Referees*: $20,000 per year until 2017, declining $5,000 per year until it reaches $10,000 and $10,000 per year thereafter, plus 11.49% average taxes.

    e. *Audit*: $92,000 per year, plus $25,000 in 2016 and every third year for special projects, plus 13% HST.

    f. *Canadian Blood Services*: $10,000 per year. No taxes.

    g. *Class Member Communications*: $50,000 in each third year, plus 13% HST.

    h. *Fund Counsel*: $90,000 per year until 2017 and declining $9,000 per year until it reaches $45,000, and $45,000 per year thereafter, plus 11.49% average taxes.

    i. *Héma-Québec*: $3,000 per year. No taxes.

j. *Independent Counsel*: $10,000 per year, plus 13% HST.

k. *Investment expenses*, including fees for investment counsel, custody of assets, and other related items are not included in this section as they have been implicitly recognized in the determination of the net interest rate.

l. *Joint Committee*: $580,000 for 2014, $650,000 for 2015 declining by $50,000 per year until 2020 and $400,000 per year thereafter. In addition, for financial sufficiency, $330,000 in 2014, $800,000 in 2015, $100,000 in 2016 and in each three year period thereafter, a total of $600,000, plus 10.39% average taxes.

m. *Medical Modeling*: $220,000 in 2014, and every third year thereafter. No taxes

n. *Monitor*: $60,000 per year until 2017, declining by $6,000 per year until it reaches $30,000 and $30,000 per year thereafter, plus 13% HST.

o. *Software Development*: $10,000 per year, plus 13% HST.

APPENDIX A – SUMMARY OF BENEFITS

This summary is taken from the Plan terms and includes items that have a bearing on the results of the valuation. The Plan terms include other details about benefits that are not material to the results presented herein. Amounts are expressed in 1999 dollars, except where indicated otherwise. Most of these payments amounts are indexed from their 1999 levels to the date of payment to reflect inflation.

In the following summaries, the specific section reference of the Plan is shown in brackets.

$10,000 for HCV infection [4.01(1)(a)]

A compensation payment of $10,000 is made upon a claimant being approved for the Plan.

$20,000 - positive PCR test [4.01(1)(b)]

A payment of $20,000 is made upon a claimant delivering a positive PCR test report. Prior to July 2002, this benefit was split into two parts, with $15,000 paid immediately and $5,000 subject to a "holdback" until such time as it could be demonstrated that the fund was sufficient to support payment of the full $20,000. The holdback amounts were authorised by the court to be paid effective July 2002.

$30,000 - Non-bridging fibrosis [4.01(1)(c)]

This payment is available to all claimants who have developed non-bridging fibrosis or have proceeded beyond that stage. As well, claimants who have received or meet a protocol for Compensable HCV Drug Therapy (whether or not treatment is undertaken) are eligible for this benefit.

A claimant may elect to waive this payment and to receive instead a Loss of Income or Loss of Services benefit. The decision as to which benefit to receive may be deferred as long as the claimant wishes.

Loss of Income [4.02]

Each claimant under the age of 65 who was in receipt of earned income and who suffers a Loss of Income caused by their infection with Hepatitis C is entitled to periodic annual payments provided:

1. the claimant is at the bridging fibrosis level or beyond, or

2. the claimant is at the non-bridging fibrosis level and is unable to work more than 20% of the usual work-week and has waived the $30,000 lump sum payment described above.

The amount of benefit is equal to 100% of the amount of lost income determined after normal payroll deductions (net income). The lost income is based on the average annual net income during the three prior years. Benefit amounts are indexed from the middle of the three-year

period used to determine the amount of loss to the year of payment based on the indexing rate under the Canada Pension Plan. There is a holdback whereby any lost income over $300,000 (1999 level) will not be paid until the courts are satisfied that the fund assets are sufficient to make such payments. Prior to October 2004, the holdback was based on a lost income amount of $75,000. Also, prior to October 2004, there was a holdback equal to 30% of the lost income payable to claimants at the non-bridging fibrosis stage.

In 2008, the courts approved payment of lost income for three claimants of up to $2.3 million. Any future claim for lost income that exceeds the $300,000 level will be subject to the approval of the courts prior to payment.

Loss of Services [4.03]

Each claimant who normally performed household duties in their home and is unable to do so as a result of their infection with Hepatitis C is entitled to periodic annual payments for Loss of Services provided:

1. the claimant is at the bridging fibrosis level or beyond, or

2. the claimant is at the non-bridging fibrosis level and has waived the $30,000 lump sum payment described above.

The amount of benefit is equal to $12 per hour of homemaker assistance required to a maximum of $240 per week.

A claimant is not entitled to Loss of Services benefits if they are receiving Loss of Income benefits.

$65,000 - Cirrhosis [4.01(1)(d)]

A payment of $65,000 is made upon a claimant being diagnosed with cirrhosis.

$100,000 - Decompensation/Cancer/Liver Transplant [4.01(1)(e)]

A payment of $100,000 is made upon a claimant being diagnosed with liver decompensation or hepatocellular cancer or has received a liver transplant. There are some other conditions that will give rise to this benefit, but they are not modeled separately in the MMWG report.

Costs of Care [4.04]

A claimant who meets the conditions for the $100,000 payment above and who has incurred costs for care that are not covered by any public or private health plan is entitled to reimbursement for all reasonable costs to a maximum of $50,000 per year.

Drug therapy [4.05]

A claimant who receives compensable HCV drug therapy (interferon, ribavirin or such other treatment approved by the courts) is entitled to be paid $1,000 for each completed month of such therapy.

Uninsured Treatment & Medication [4.06]

A claimant who receives a generally accepted treatment and medication for HCV that is not otherwise recoverable from a private or public health plan is entitled to be reimbursed for all such reasonable costs.

Out-of-pocket Expenses [4.07]

A claimant who incurs out-of-pocket expenses due to infection by HCV that are not otherwise recoverable from a private or public health plan is entitled to be reimbursed for all such reasonable costs. This includes amounts for travel, hotels, meals, telephone and other similar expenses attributable to seeking medical advice or treatment and medication as well as costs incurred in establishing a claim under the Plan.

Secondarily Infected Persons

A spouse or child of an HCV infected claimant (or an HCV infected person who has opted out of the Plan) where that person was infected with HCV as a result of the relationship may make his or her own claim for compensation under the Plan. To be eligible, the spouse must file a claim within three years of the date the primarily infected person submits their claim. There is no such limitation on claims submissions by children. Benefits to secondarily infected persons are the same as for primarily infected persons.

HCV related death before 1 January 1999 [5.01]

If an approved HCV infected person died prior to 1 January 1999 as a result of HCV, their personal representative and/or family members are entitled to receive either:

1. $50,000 plus any uninsured funeral expenses incurred to a maximum of $5,000 plus the compensation to dependants and approved family members as outlined below; or,

2. $120,000 plus uninsured funeral expenses.

HCV related death after 1-Jan-1999 [5.02]

If a claimant dies after 1 January 1999 as a result of HCV, any uninsured funeral expenses incurred to a maximum of $5,000 and compensation to dependants and approved family members as outlined below are payable. This is in addition to any other benefit entitlement the claimant has under the Plan.

Compensation to Dependants [6.01]

Following the death of a person as a result of HCV, the dependants of that person are entitled to receive

1. Loss of Support – from the date of death to the date the infected person would have attained age 65, dependants will be paid an annual amount equal to the net income of the deceased person, reduced by 30% to account for the personal living expenses of the deceased.

2. Loss of Services – from the date of death of the infected person, dependants will be paid an annual amount equal to $12 per hour to a maximum of $240 per week as compensation for Loss of Services in the home of the deceased. The Plan contains no reference as to how long these payments are to be made, however we understand that the administrator is paying this Loss of Services for the life expectancy of the deceased, calculated according to the Canadian Life Tables as published by Statistics Canada.

Where the dependants are entitled to both Loss of Support and Loss of Services, only one is payable. Should the Loss of Support payments cease upon the date the deceased would have attained age 65, then Loss of Services payments are payable thereafter.

The amount of benefit payable is to be split among all dependants in such manner as the dependants or administrator determine.

Compensation to Approved Family Members [6.02]

Following the death of a person as a result of HCV, the family members of that person are entitled to receive

a. $25,000 for the spouse

b. $15,000 for each child under the age of 21 at the date of death

c. $ 5,000 for each child aged 21 or over at the date of death

d. $ 5,000 for each parent

e. $ 5,000 for each sibling

f. $ 500 for each grandparent

g. $ 500 for each grandchild

HIV Secondarily Infected Claimants [4.08]

An HCV infected person who is also a secondarily infected HIV person may only receive compensation from this Plan once their claims would otherwise have exceeded $240,000.

ADDITIONAL BENEFITS FOR HAEMOPHILIACS WITH HEPATITIS C

The following benefits are payable upon a claimant's election instead of the above listed benefits, and are only available to an approved haemophiliac claimant. Section references are to the Haemophiliac Plan.

Haemophiliac infected with both HCV and HIV [4.08(2)]

If the claimant is a primarily infected haemophiliac and is also infected with HIV, a lump sum amount of $50,000 may be elected instead of all other compensation under the Plan and is in full satisfaction of all claims.

Death prior to 1 July 1999 [5.01(4)]

If an approved HCV infected person died prior to 1 January 1999 as a result of HCV, their personal representative and/or family members are entitled to receive either:

1. $50,000 plus any uninsured funeral expenses incurred to a maximum of $5,000 plus the compensation to dependants and approved family members as outlined above; or,

2. $120,000 plus uninsured funeral expenses; or,

3. $72,000 if the claimant was a primarily infected haemophiliac and was also infected with HIV and if all dependants and other family members agree to accept this amount in full satisfaction of all claims.

HIV PROGRAM

Persons who are infected with HIV resulting from a relationship (partner or child) of a primarily infected person who is an approved Extraordinary Assistance Plan recipient are eligible to receive $240,000 compensation from this Plan. There is no requirement that the person be infected with HCV. A maximum of 240 such claims will be accepted.

APPENDIX B – SUMMARY OF CLAIMANT DATA

SOURCE OF DATA

The claimant data used to produce the results in this report can be split into two groups, the current known cohort and the assumed unknown cohort.

The data for the current known cohort was provided by the Joint Committee and forwarded to us via the Department of Justice. The data was split between a master list and several supporting lists. For each known claimant, as at 31 December 2013, the master list specified the claimant group (transfused or haemophiliac), gender, date of birth, HIV status, current disease level, etc. The supporting lists contained information on benefits paid and benefits currently in pay to the claimant and/or their beneficiaries, as dictated by the claimant's current disease level. The master list and supporting lists were consolidated into one file containing all of the information required to value the current known cohort.

The data for the assumed unknown cohort was created based on the assumptions set out in Section 6 - Hepatitis C Claimant Cohort. The unknown claimants are assumed to mirror the known claimants with respect to age, status (alive or deceased) and disease level.

DATA CHECKS ON THE CURRENT KNOWN COHORT

After consolidating the master list and supporting lists into one file, we performed a number of checks for reasonableness.

- Compare the number of claimants at each status with the number from the 2010 data.
- Compare the 2010 data for each known claimant with the 2013 data for any changes that would not be reasonable (such as a large number of changed dates of birth, inappropriate change in disease level or status).
- Reviewed the 2010 and 2013 data for missing claimants. There were no missing claimants.
- Compare the counts of the claimants who were alive, deceased after 1999 and deceased before 1999 for the known claimants to the similar numbers reported by Eckler.

We made the following adjustments to the data provided for the current known cohort:

- For claimants at disease level 3, we have assumed that 50% are at clinical stage F1 and 50% at stage F2. This is based on the ratios presented in the MMWG report.

- For claimants at disease level 6 for whom a transplant is indicated, we have assumed that they have survived for at least 12 months following the transplant.

- For claimants at level 6 who are indicated to have renal failure, Cryoglobulinemia or Glomerulonephritis ("atypical level 6"), we followed the advice received from the MMWG and from Dr. Bain, a gastroenterologist who provides advice to the Joint Committee. We considered they would be similar to other level 6 claimants, but

- assumed they would all receive treatment using sofusbovir-based doublets;
- assumed that there would be no recovery from disability (loss of income or loss of services);
- modified the incidence of Cost of Care to be ⅓rd of our best estimate assumptions; and
- modified the mortality to consider ⅔rds of deaths to be HCV-related and the balance as not HCV-related[17].

- For claimants at level 6 who are indicated to have lymphoma, we followed the advice received from the MMWG and modelled them the same as decompensated claimants.

COHORT DISTRIBUTIONS AS AT 31 DECEMBER 2013

Table 146 shows the claimant cohorts used in the valuation. Tables B.1 and B.2 below show the disease level as at 31 December 2013 for the known claimants together with their disease level as of 31 December 2010.

The following may assist in understanding the table.

Looking at the first row in Table B.1, the right hand column shows that there were 492 transfused claimants at level 1 as of 31 December 2010.

As one reads across the row from the left, we see that as of 31 December 2013, 484 of those claimants remain at level 1; three of them are now at level 2 and five of them have died from non-HCV causes. Looking at the table row by row, we can see how claimants as of 31 December 2010 have progressed.

From another perspective, look at the column headed "DA9 HCV". This column shows the transfused claimants as of 31 December 2013 who have died as a result of HCV. There are a total of 480 (bottom row).

Looking at the second last row in the DA9 HCV column, we see that 9 of these deaths are new entrants – that is their claim was approved at some time in the period 1 January 2011 to 31

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17 This differed from the advice we received from the MMWG that these claimants would have no ongoing HCV-related issues and death would not be HCV-related. We suspect that the definition of "HCV-related" used by the MMWG in their response was based on a medical rather than a legal definition of causation. For the purposes of benefit entitlement, we are informed that the legal definition is utilized. However, the opinion on recovery from disability was very different, with the MMWG expecting full recovery after about six months and Dr. Bain suggesting there may be only partial recovery in some patients. Due to immateriality of the liability involved, we decided to utilize Dr. Bain's more conservative view.

December 2013. 422 of the transfused who died as a result of HCV were claimants as of 31 December 2010. In the third last row are 13 claimants that were classified as a non-HCV death in 2010 who have since been reclassified. The balance of the rows above shows claimants who were alive in December 2010 who have since died as a result of HCV.

Table B.1 – Disease Levels in 2010 and 2013 – Transfused Claimants

	2013 Disease Level									
2010 Disease Level	1	2	3	4	5	6	DB9[18]	DA9-HCV[19]	DA9 non-HCV[19]	Total by Level in 2010
1	484	3							5	492
2		960	52	2	7	3		1	17	1042
3			812	6	12	6		3	10	849
4				162	6	2		2	4	176
5					124	5		14	5	148
6						69		16	5	90
DB9[18]							179			179
DA9-HCV[19]								422		422
DA9-non[19]								13	383	396
New entrant	26	30	34	5	9	2	5	9	10	130
Total by Level in 2013	**510**	**993**	**898**	**175**	**158**	**87**	**184**	**480**	**439**	**3924**

[18] DB9 – Deceased prior to 1999.

[19] DA9 – Deceased after 1999 – either HCV related or not-HCV related

Table B.2 – Disease Levels in 2010 and 2013 – Haemophiliac Claimants

	2013 Disease Level									
2010 Disease Level	1	2	3	4	5	6	DB9[20]	DA9-HCV[21]	DA9 non-HCV[21]	Total by Level in 2010
1	143									143
2		190	7	2		1		1	1	202
3			317	7	5	3		3	3	338
4				71	1	1		1	1	75
5					76	5		1	4	86
6						40		8		48
DB9[20]							301			302
DA9_HCV[21]								113		113
DA9-non[21]								4	39	43
New entrant	3	2	2	1					2	10
Total by Level in 2013	**146**	**192**	**326**	**81**	**82**	**50**	**301**	**131**	**50**	**1359**

20 DB9 – Deceased prior to 1999.

21 DA9 – Deceased after 1999 – either HCV related or not-HCV related

APPENDIX C – DESCRIPTION OF ACTUARIAL MODEL

The model we have built is composed of several modules, outlined as follows:

Data Entry Module

In this module, all relevant data fields are populated using data provided by the administrator, which reflects the actual claimants at their actual age and disease stage. A similar set of data is created for the unknown claimants based on the assumed disease stage, age distribution, status (alive, deceased from HCV, deceased from other causes), cohort (transfused or haemophiliac), and other assumptions as discussed in Section 6 - Hepatitis C Claimant Cohort.

Assumptions Module

This module is used to build sets of assumptions called scenarios, which are in turn used to calculate results. There are separate sets of assumptions for the transfused and haemophiliac groups.

Transition Matrix Module

The transition matrix contains the MMWG methodology and transition probabilities used in order to project each claimant's disease progression. This module also incorporates the excess mortality from HCV assumption.

Calculation Module

Once the data has been entered and a scenario is chosen, individual claimants are automatically run through the calculation engine one at a time. This is commonly referred to as a seriatim valuation.

The data for each claimant is combined with the scenario's assumptions and the Plan specifics in order to produce liabilities and future expected year-by-year cash flows.

Each claimant is projected forward one year at a time. Each year, the model assesses the probability of them remaining at the same disease stage, changing to another disease stage, dying from HCV, dying from non-HCV causes, undergoing a successful treatment, incurring an eligible expense (e.g. drug therapy, out-of-pocket), incurring a Loss of Income or Loss of Services claim and recovering from disability and thereby ceasing to receive Loss of Income or Loss of Services.

Economic and demographic assumptions along with eligible benefit amounts are then taken into account to calculate the future cash flows for up to 100 years, as well as the present values of the liabilities. Both cash flows and present values are summarized by claimant and by benefit to facilitate analysis.

Cohort Progression Module

A by-product of the model is the ability to produce future cohort disease distributions similar to those presented in the MMWG Report at Tables 13.1 to 14.8.

Results Module

The results are then summarized in various reports to facilitate review and checking of the model, to provide the information necessary for inclusion in this report and to quantify effects of assumption changes and sensitivities.

APPENDIX D – SUMMARY OF ACTUARIAL ASSUMPTIONS

This is a summary of the main actuarial assumptions used in this report. The 2013 assumptions were selected jointly with Eckler and are the same as Eckler used for their 2013 report. The 2010 assumptions used by Morneau Shepell are also shown for comparison. Some of the assumptions used by Eckler in 2010 differed from the Morneau Shepell assumptions. The assumptions are explained in more detail in the body of this report.

Disease Progression - Section 5

Cohort Assumptions - Section 6

Other Assumptions - Section 1

DISEASE STAGES

The Compensation Plan uses different descriptions of the various levels of the disease from the stages that are used in the MMWG Report. Further, some stages used in the MMWG Report do not correspond directly to the levels on which compensation is based.

In particular, we understand that non-bridging fibrosis normally occurs sometime during the stages identified as Fibrosis 1 and Fibrosis 2 in the MMWG Report. By assuming that non-bridging fibrosis occurs coincident with Fibrosis 1, we are including a level of conservatism in the results, including the best estimate results.

The following table shows the terms that are deemed to be equivalent for purposes of applying the MMWG stages to the Plan's compensation levels.

Table D.1 – Hepatitis C Disease Stages and Levels

MMWG Stage	MMWG Stage Description	Compensation Plan Levels	Compensation Plan Description
F0(RNA-)	Fibrosis Stage 0 – RNA negative	1	Claimants who have cleared the virus
F0(RNA+)	Fibrosis Stage 0 – RNA positive	2	PCR test positive
F1	Fibrosis Stage 1	3	Non-Bridging Fibrosis
F2	Fibrosis Stage 2		
F3	Fibrosis Stage 3	4	Bridging Fibrosis
F4	Cirrhosis	5	Cirrhosis
HCC	Hepatocellular Cancer	6	Cancer
Decomp	Decompensated cirrhosis		Liver decompensation
Transplant	Liver Transplant		Liver Transplant
Death	Liver related death		Death

Table D.2a - Cohort Size –Transfused Claimants

Disease Level	Disease Stage	Known Claimants	Unknown Claimants	Total
Alive Claimants				
1	F0 – RNA-	510	32	542
2	F0 – RNA+	993	62	1,055
3	F1	449	28	477
3	F2	449	28	477
4	F3	175	11	186
5	Cirrhosis	158	10	168
6	Decompensated	36	4	40
6	Lymphoma	5	0	5
6	Renal	8	0	8
6	Cryoglobulinemia	10	0	10
6	Glomerulonephritis	2	0	2
6	Transplant	16	1	17
6	HCC	10	1	11
Total Alive		**2,821**	**177**	**2,998**
Deceased				
Died before 1999	All	184	25	209
Died after 1998 - non HCV	F0 – RNA-	179	10	189
	F0 – RNA+	166	10	176
	F1	46	3	49
	F2	-	0	-
	F3	17	1	18
	Cirrhosis	18	1	19
	Level 6	13	1	14
Died after 1998 - HCV	F0 – RNA-	-	0	-
	F0 – RNA+	19	1	20
	F1	23	1	24
	F2	-	0	-
	F3	11	1	12
	Cirrhosis	73	4	77
	Level 6	354	19	373
Total Deceased		**1,103**	**77**	**1,180**
Total Cohort		**3,924**	**250**	**4,166**

Table D.2b - Cohort Size –Haemophiliac Claimants

Disease Level	Disease Stage	Known Claimants	Unknown Claimants	Total
Alive Claimants				
1	F0 – RNA-	146	2	148
2	F0 – RNA+	192	3	195
3	F1	163	3	166
3	F2	163	3	166
4	F3	81	1	82
5	Cirrhosis	82	1	83
6	Decompensated	26	1	27
6	Lymphoma	3	0	3
6	Renal	-	0	-
6	Cryoglobulinemia	4	0	4
6	Glomerulonephritis	1	0	1
6	Transplant	6	0	6
6	HCC	10	0	10
Total Alive		**877**	**14**	**891**
Deceased				
Died before 1999	All	301	3	304
Died after 1998 - non HCV	F0 – RNA-	9	1	10
	F0 – RNA+	17	2	19
	F1	12	2	14
	F2	-	0	-
	F3	1	0	1
	Cirrhosis	8	1	9
	Level 6	3	0	3
Died after 1998 - HCV	F0 – RNA-	-	0	-
	F0 – RNA+	1	0	1
	F1	9	0	9
	F2	-	0	-
	F3	2	0	2
	Cirrhosis	22	1	23
	Level 6	97	2	99
Total Deceased		**482**	**12**	**494**
Total Cohort		**1,359**	**26**	**1,385**

For haemophiliacs, 25.7% of the unknown claimants are assumed to be coinfected with HIV.

Table D.3 - Transition Probabilities

From Stage	To Stage	Transition Rates 2010 - PfAD	Transition Rates 2013 - BE	Transition Rates 2013 - PfAD
F0(RNA-)	F1	0.0%	0.0%	Same
F0(RNA+)	F0(RNA-)	1.7%	1.7%	
F1	SVC	n/a	1.7%	
F2	SVC	n/a	1.0%	
F3	SVC	n/a	0.5%	
F0(RNA+)	F1	5.7%	5.4%	
F1	F2	14.5%	12.0%	
F2	F3	15.0%	13.5%	
F3	F4	12.0%	13.8%	
F4	Decompensation	6.5%	7.8%	
Decompensation	Transplant	3.3%	0.4%	
F1	HCC	0.01%	0.01%	
F2	HCC	0.01%	0.01%	
F3	HCC	0.1%	0.1%	
F4	HCC	3.3%	2.5%	
Decompensation	HCC	n/a	2.5%	
HCC	Transplant	10.0%	0.4%	

Effect of Treatment on Fibrosis Progression

Treatment is assumed to be considered for all patients at stages F0(RNA+) to F4. At each of these stages a percentage of the patients are given treatment, and a percentage of those treated react successfully to the treatment.

For 2013, we assumed that 60% of claimants who have previously been treated have cleared the virus.

For 2013, all known claimants who have not previously been treated or have not cleared the virus following a prior treatment are eligible for one round of treatment during the period 2014 to 2018 with no additional treatments assumed thereafter. For the unknown claimants, we assumed each person would be eligible for one round of treatment in accordance with the treatment rates below during the five-year period following their approval.

Table D.4a - Treatment Probabilities – 2013

	Treatment Naïve Without HIV	Treatment Naïve With HIV	Previously Treated Without HIV	Previously Treated With HIV
Treatment rate (per annum)	34.0%	19.3%	38.2%	17.5%
Percent of Treatments using:				
• PEG-IFN/RBV	0%	0%	0%	0%
• PEG-IFN/RBN based triple therapy	14.3%	8.3%	7.1%	8.3%
• Sofosbuvir-based doublet	50.0%	25%	35.7%	8.3%
• 3d regimen plus RBV	35.7%	66.7%	57.1%	83.4%
Treatment Efficacy				
• PEG-IFN/RBV	45.5%	37.1%	37.4%	30.5%
• PEG-IFN/RBN based triple therapy	70.0%	73.5%	53.8%	53.8%
• Sofosbuvir-based doublet	94.6%	80.2%	95.4%	80.9%
• 3d regimen plus RBV	96.2%	81.6%	96.3%	81.7%
Annual Cure Rate*	31.2%	15.6%	35.5%	13.9%
5-Year Cure Rate**	**80.2%**	**53.0%**	**84.5%**	**48.9%**

* The annual cure rate is the percent of all claimants who had not received treatment since 1 January 2014 who are assumed to be cured through taking drug treatment. The medical model assumes that only one treatment regimen will be given per claimant on and after 1 January 2014, regardless of any treatments received prior to that.

** The 5-Year Cure rate is the percentage of all claimants who are assumed to be cured during the period 2014 to 2018.

A patient who is successfully treated is assumed to remain at their disease level for life, with the exception of those at F4 who are assumed to transition to decompensation at half the regular rate.

For the provision for adverse deviations, we assumed the treatment efficacy will be 80% of the best estimate efficacy rates.

For the 2010 valuation, we assumed that treatment was given at any time for stages F1 to F4 with no limit to the number of possible treatments per claimant (treatment after age 65 was assumed with the 10% rate reduced to 3.3%).

Table D.4b - Treatment Probabilities - 2010

Stage	Percentage of all Patients who Receive Treatment	Successful Response Among Those Treated	Successful Response Among all Patients
F1	10.0%	49.0%	4.9%
F2	10.0%	49.0%	4.9%
F3	10.0%	49.0%	4.9%
F4	10.0%	31.0%	3.1%

In 2010, a successfully treated patient was assumed to be subject to transition probabilities at 10% of the transition rates. The reduced probability applied at all stages to liver decompensation for the patient's future life but did not affect the transition rates to cancer (HCC).

OTHER ASSUMPTIONS

Mortality Assumptions

Table D.5 - Mortality Assumptions**

Assumption	2010	2013 - BE	2013 - PfAD
Mortality from all causes other than HCV	Canada Life Tables 2000 to 2002 for transfused. 175% of Canada Life Tables 2000 to 2002 for haemophiliacs.	Canada Life Tables 2009 to 2011 for transfused and haemophiliacs.	Same
Mortality from all causes other than HCV for those co-infected with HIV	624% of the Canada Life Tables 2000 to 2002	624% of the Canada Life Tables 2009 to 2011	Same
Mortality due to HCV from Level 6 – Decompensation	18.6%	Greater of Canada Life mortality* and 15.2%	Same
Mortality due to HCV from Level 6 – HCC – cancer	35.0%	Greater of Canada Life mortality* and 18.2%	Same
Mortality due to HCV from liver transplant - first year - thereafter	 14.6% 4.4%	Greater of Canada Life mortality* and: 8.6% 3.9%	Same
Gender for mortality table - Transfused Cohort	Based on claimant's gender. Where gender not stated, 48.8% male.	Based on claimant's gender. Where gender not stated, 49.2% male.	Same
- Haemophiliac Cohort	Based on claimant's gender. Where gender not stated, 85.0% male.	Based on claimant's gender. Where gender not stated, 84.7% male.	Same

** The Canada Life mortality utilized includes the 624% adjustment for co-infected persons.*

*** For 2010, the mortality assumptions were the same for best estimate and provision for adverse deviations.*

Table D.6a – Excess HCV-Related Mortality - 2013

	Disease Level						Expected Average
	1	2	3	4	5	6	
Claimants who have not cleared the virus							
HCV Death	0%	10%	35%	45%	80%	100%	33%
Non-HCV Death	100%	90%	65%	55%	20%	0%	67%
Claimants who have cleared the virus							
HCV Death	0%	0%	0%	25%	60%	100%	22%
Non-HCV Death	100%	100%	100%	75%	40%	0%	78%

For 2013, the assumptions for best estimate and provision for adverse deviations are the same.

The percentages for excess HCV-related mortality are applied to allocate deaths based on the Canada Life Tables between those that are considered HCV related deaths and those that are not considered HCV related deaths. These HCV related deaths are in addition to those assumed under the MMWG model as set out in Section 5.

The MMWG model was changed for 2013 to assume that all deaths at level 6 are as a result of HCV.

The 2010 assumptions were applied only to those who had not cleared the virus.

Table D.6b – Excess HCV-Related Mortality - 2010

	Disease Level						Expected Average
	1	2	3	4	5	6	
Best Estimate							
HCV Death	0%	10%	40%	50%	80%	80%	33%
Non-HCV Death	100%	90%	60%	50%	20%	20%	67%
Provision for Adverse Deviation							
HCV Death	0%	20%	50%	65%	90%	90%	45%
Non-HCV Death	100%	80%	50%	35%	10%	10%	55%

Economic Assumptions

Table D.7 - Economic Assumptions

	2010			2013		
Asset Class	**Allocation**	**Expected Return**	**Contribution to Fund Return**	**Allocation**	**Expected Return**	**Contribution to Fund Return**
Universe Bonds	3.7%	2.90%	0.11%	5.0%	4.10%	0.21%
Short Term Bonds	6.9%	2.50%	0.17%	6.7%	4.10%	0.27%
Real return bonds	66.0%	3.35%	2.21%	64.0%	2.90%	1.86%
Equities						
- Canada	4.3%	7.50%	0.32%	5.7%	7.60%	0.43%
- US	1.5%	7.50%	0.11%	2.8%	7.60%	0.21%
- International	1.7%	7.50%	0.13%	2.80%	7.60%	0.21%
Notional assets	15.9%	2.50%	0.40%	13.0%	3.10%	0.40%
Expected return	100.0%		3.45%	100.0%		3.60%
Rebalancing effect			0.12%			0.24%
Less Inflation			-2.25%			-2.50%
Less Expenses			-0.04%			-0.04%
Discount rate - BE			**1.28%**			**1.30%**
Provision for Adverse Deviations			-0.23%			-0.25%
Discount Rate - PfAD			**1.05%**			**1.05%**

Assumptions About Benefit Amounts

Benefit amounts with a value shown for 1999 are amounts set out in the Plan. Where there is no value shown for 1999, the amounts are *assumptions* about the expected amount of a claim.

Table D.8 – Assumptions about Benefit Amounts

Benefit	1999 Amount	2010[22]	2013 - BE	2013 - PfAD
Level 1	10,000	12,744.23	13,457.74	Same
Level 2	20,000	25,488.46	26,915.48	Same
Level 3	30,000	38,232.69	40,373.22	Same
Level 5	65,000	82,837.50	87,475.30	Same
Level 6	100,000	127,442.30	134,577.39	Same
Loss of services - maximum	12,480	15,904.80	16,795.26	Same
Loss of services – assumed benefit				
• transfused		15,000	16,000	Same
• haemophiliac		15,000	16,000	
Loss of income - maximum	300,000 [23]	382,327	403,732	Same
Loss of income – assumed benefit				
• transfused		35,000	39,000	43,000
• haemophiliac		38,000	48,000	53,000
Cost of Care (level 6)		16,000[24]	30,000	45,000
HCV Drug Therapy monthly amount	1,000	1,274	1,346	Same
HCV Drug Therapy total claim		14,019	4,440	4,845
Uninsured treatment and medication for those who have not cleared the virus:				
• transfused		3,000[25]	1,500	1,500
• haemophiliac		4,000	3,500	3,500
Treatment costs associated with treatment for clearing the virus				
• PEG-IFN/RBC-based triple therapy		incl. above	60,000	110,000
• Sofosbuvir-based doublets			85,000	
• 3D regimen plus RBV			85,000	
Percent of treatment costs reimbursed by the Fund				
• Claimants under 65			60%	60%
• Claimants over 65			100%	100%

22 The 2010 assumptions about benefits amounts are the same for best Estimate and Provision for Adverse deviations, with the exception of Cost of Care and Uninsured Treatment and Medication.

23 In 2008, the courts increased the maximum Loss of Income to $2,300,000, but limited it to three known claimants. Future claimants with losses in excess of $300,000 (1999 dollars) may apply to the courts for a review of their loss.

24 For 2010, the PfAD assumption for Cost of Care is an average of $21,000 per year.

Table D.8 – Assumptions about Benefit Amounts

Benefit	1999 Amount	2010[22]	2013 - BE	2013 - PfAD
Out-of-pocket Expenses:				
claimants who have not cleared the virus				
• transfused		1,700	1,800	1,800
• haemophiliac		2,500	2,600	2,600
claimants upon clearing the virus				
• transfused		n/a	1,200	2,400
• haemophiliac		n/a	5,000	10,000
Uninsured Funeral Expenses				
• maximum	5,000	6,372	6,729	Same
• assumed average claim	n/a	5,000	4,300	
Haemophiliac Coinfected with HIV lump sum option	50,000	63,721	67,289	Same
Death prior to 1999				
Lump Sum Options				
• $50,000 plus	50,000	63,721	67,289	Same
• $120,000	120,000	152,931	161,493	
• $72,000 (coinfected haemophiliac)	72,000	91,758	96,896	
Family Benefits				
• transfused		80,000	75,000	Same
• haemophiliac		80,000	85,000	
Dependant benefits – Loss of Support				
• transfused		30,000	30,000	34,000
• haemophiliac		32,000	34,000	36,000
Dependant benefits – Loss of Services				
• transfused		15,000	16,000	Same
• haemophiliac		15,000	16,000	
Death after 1999				
Family Benefits				
• transfused		55,000	50,000	Same
• haemophiliac		55,000	60,000	
Dependant benefits – Loss of Support				
• If currently receiving loss of income		30,000	70% of LOI	70% of LOI
• Transfused		30,000	31,000	34,000
• Haemophiliac		32,000	33,000	36,000

25 For Uninsured Treatment and Medication, the PfAD assumption for 2010 is an average claim in 2011 of $3,000 for transfused and $4,000 for haemophiliacs with the amount increasing annually thereafter by 5% in addition to inflation.

Table D.8 – Assumptions about Benefit Amounts

Benefit	1999 Amount	2010[22]	2013 - BE	2013 - PfAD
Dependant benefits – Loss of Services				
• Currently receiving loss of services		15,000	16,000	Same
• Transfused		15,000	16,000	
• Haemophiliac		15,000	16,000	
HIV Program	240,000	305,862	322,986	Same

Table D.9 – Assumptions about Eligibility and Timing of Compensation Payments

Benefit Payment	2010	2013 - BE	2013 - PfAD
Loss of Income – Level 3			
▪ Proportion claiming	3% elect under age 65 0% elect over age 64	3% elect under age 65 0% elect over age 64	Same
Loss of Services – Level 3			
▪ Proportion claiming	2% elect under age 65 5% elect over age 64	2% elect under age 65 7% elect over age 64	Same
Loss of Income – Levels 4 and 5			
▪ Proportion claiming – unknown	18% under age 65 0% over age 64	21% under age 65 0% over age 64	Same
▪ Proportion claiming - known[26]	7% transfused 0% haemophiliac	5.8% transfused 3.2% haemophiliac	
Loss of Income – Level 6			
▪ Proportion claiming - unknown	17% under age 65 0% over age 64	25% under age 65 0% over age 64	Same
▪ Proportion claiming - known	0% transfused 0% haemophiliac	0% transfused 0% haemophiliac	
Loss of Services – Levels 4 and 5			
▪ Proportion claiming - unknown	39% under age 65 57% over age 64	30% under age 65 51% over age 64	Same
▪ Proportion claiming - known			
- Transfused	11% under age 65 25% over age 64	6.7% under age 65 27.3% over age 64	
- Haemophiliac	5% under age 65 0% over age 64	0% under age 65 0% over age 64	

[26] The known proportion claiming applies to known claimants already at the indicated level who have not yet commenced a claim. Known claimants already on claim are assumed to continue. Known claimants who transition into a level are assumed to claim based on the rates for unknown claimants.

Table D.9 – Assumptions about Eligibility and Timing of Compensation Payments

Benefit Payment	2010	2013 - BE	2013 - PfAD
Loss of Services – Level 6			
▪ Proportion claiming - unknown	57% under age 65 74% over age 64	40% under age 65 65% over age 64	Same
▪ Proportion claiming - known			
- Transfused	25% under age 65 18% over age 64	5.3% under age 65 40.9% over age 64	
- Haemophiliac	10% under age 65 0% over age 64	0% under age 65 0% over age 64	
Cost of Care			
▪ Proportion claiming	45% each year PfAD: 55% each year	40% each year	Same
Drug Therapy			
▪ Incidence	Level 3 and beyond	100% of claimants coincident with undergoing treatment	100% of claimants coincident with undergoing treatment
▪ Proportion claiming			
▪ Level 2	0%		
▪ Level 3	60%		
▪ Level 4	70%		
▪ Level 5	80%		
Uninsured Treatment & Medication			
Proportion claiming (of those who have not cleared the virus):			
▪ Transfused	[27]	4.5%	Same
▪ Haemophiliac		7.5%	
Claimants being treated for purpose of clearing the virus		In accordance with Table D.4a	
Out-of-pocket expenses			
▪ Incidence	New claimants and all at levels 3 to 6	Claimants who have not cleared the virus	Same
▪ Proportion claiming	25% of new claimants		
- Transfused	5% at levels 3 to 6	8% at levels 1 to 6	
- Haemophiliac	7% at levels 3 to 6	8% at levels 1 to 6 100% coincident with clearing the virus	
Secondarily Infected Persons	All SIP claimants included in known and unknown cohort.	All SIP claimants included in known and unknown cohort.	Same

[27] Uninsured Treatment and Medication assumption for 2010 was 4% of transfused and 6.5% of haemophiliac claimants at levels 2 to 6 will have a claim each year. There was no separate assumption related to the cost of treatment for the purpose of clearing the virus.

Table D.9 – Assumptions about Eligibility and Timing of Compensation Payments

Benefit Payment	2010	2013 - BE	2013 - PfAD
$50,000 Full Settlement Option			
▪ Incidence	Haemophiliacs with HCV and HIV	Haemophiliacs with HCV and HIV	Same
▪ Proportion claiming	100% level 1 and 20% level 2 who have not yet made an election	100% level 1	
HCV related death before 1-Jan-1999 - Transfused			
▪ Known claimants	Payable as elected.	Payable as elected.	Same
▪ Unknown claimants	48% elect $120,000 52% elect $50,000+	48% elect $120,000 52% elect $50,000+	
	100% - funeral expense 100% - family benefits 20% - Loss of Support 80% - Loss of Services	100% - funeral expense 100% - family benefits 20% - Loss of Support 80% - Loss of Services	
HCV related death before 1-Jan-1999 - Haemophiliac			
▪ Known Claimant	Payable as elected	Payable as elected.	Same
Unknown Claimants	0% elect $72,000 48% elect $120,000 52% elect $50,000+	0% elect $72,000 48% elect $120,000 52% elect $50,000+	
	100% - funeral expense 100% - family benefits 20% - Loss of Support 80% - Loss of Services	100% - funeral expense 100% - family benefits 50% - Loss of Support 50% - Loss of Services	
HCV related death after 1998[28]			
▪ Deaths prior to 2014 for known claimants	Continue at current amount plus indexing	Continue at current amount plus indexing	Same
▪ Future deaths and unknown claimants	100% - funeral expense 100% - family benefits 10% - Loss of Support 40% - Loss of Services	100% - funeral expense 100% - family benefits 55% - Loss of Support[29] 20%-Loss of Svcs <65[30] 60%-Loss of Svcs >65[31]	

[28] For deaths while receiving Loss of Income or Services, we assume the dependants will claim a Loss of Support or Services 100% of the time and Loss of Support will be 70% of the lost income amount.

[29] Loss of Support prior to date claimant would have attained 65 with Loss of Services after. Known claimants not currently on Loss of Income, 45% will get Loss of Support and 5% Loss of Services.

[30] Loss of Services applies for deaths prior to 65 and is payable for life expectancy of claimant. Known claimants not currently on Loss of Income, 45% will get Loss of Support and 5% Loss of Services.

[31] Loss of Services applies for deaths after age 65 and is payable for life expectancy of claimant. For known claimants not currently on Loss of Income, 40% will get Loss of Services.

Table D.9 – Assumptions about Eligibility and Timing of Compensation Payments

Benefit Payment	2010	2013 - BE	2013 - PfAD
Outstanding Payments	Provided by administrator	Provided by administrator	Same
HIV Secondarily Infected	Ignored	No claims	Same
HIV Program	6 future payments of $240,000 each plus admin costs of $12,000 to 2011	5 future payments of $240,000 each occurring every 3 years	Same

Table D.10 - Recovery Rates from Loss of Income and Loss of Services After Clearing the Virus

	Best Estimate			PfAD		
Years Since Disability	Levels 3 & 4	Level 5	Level 6	Levels 3 & 4	Level 5	Level 6
1	50.0%	25.0%	0%	25%	13%	0%
.2	30.0%	15.0%	0%	15%	8%	0%
3	25.0%	12.5%	0%	13%	7%	0%
4	25.0%	12.5%	0%	13%	7%	0%
5	15.0%	7.5%	0%	8%	4%	0%
6	10.0%	5.0%	0%	5%	3%	0%
7	5.0%	2.5%	0%	3%	2%	0%
8	5.0%	2.5%	0%	3%	1%	0%
9+	0.0%	0.0%	0%	0%	0%	0%

APPENDIX E – GLOSSARY OF TERMS USED

Administrator	Crawford Class Action Services, a division of Crawford & Company
Eckler Report	Actuarial Report to the Joint Committee Assessing the Financial Sufficiency of the 1986-1990 Hepatitis C Trust as of December 31, 2010, prepared by Richard Border, FIA, FCIA, and Wendy Harrison, FSA, FCIA.
Haemophiliac Cohort	The group of approved claimants who are haemophiliacs.
HIV Program	A compensation program for people who are secondarily infected with HIV and where the primarily infected person is eligible for benefits from the Extraordinary Assistance Program. There is no requirement that they also be infected with HCV.
HIV Co-infection	Describes a person who is infected with both HCV and HIV. There are additional benefits available to haemophiliacs who are HIV co-infected.
HIV Secondarily Infected Person	A haemophiliac infected with HCV who is also secondarily infected with HIV. No benefits are payable from this Plan unless the total to which they would have been entitled exceeds $240,000.
Joint Committee	The committee established under section 9.01 of the Plan.
Joint Committee Report	Report of the Joint Committee Relating to Financial Sufficiency of the 1986-1990 Hepatitis C Trust as at December 31, 2010, dated July 27 2011.
Known claimants	Those claimants who have been approved as of the date of the valuation and are included in the data provided by the Administrator.
Level	A disease level as defined under the Plan. Levels are related to stages as modelled in the MMWG Report.
MMWG Report	"Estimating the Prognosis of Canadians Infected With the Hepatitis C Virus Through the Blood Supply, 1986-1990 - Fifth Revision of Hepatitis C Prognostic Model Based on the Post-Transfusion Hepatitis C Compensation Claimant Cohort", dated September 2014 by Wendong Chen, MD PhD, Qilong Yi MD MSc PhD, William Wong, PhD and Murray Krahn MD MSc FRCPC
Non-haemophiliac Cohort	See Transfused Cohort
Plan	Transfused HCV Plan and the Haemophiliac HCV Plan as attached to and forming part of the judgement of the Honourable Mr. Justice Warren K. Winkler dated 22 October 1999, (court file number 98-CV-141369).
Plan Terms	The provisions regarding payment of benefits as set out in the Plan.
Previously Treated	Those claimants who have received treatment prior to 2014 but treatment was unsuccessful. They are assumed in the medical model to be eligible for one additional course of treatment during the period 2014 to 2018.

Stages	A disease stage as modelled under the MMWG Report. Stages are related to the compensation levels under the Plan.
SVC	Spontaneous Viral Clearance – this indicates a person is cured.
SVR	Sustained Viral Response – this is an indicator for clearing the virus or being cured. SVR is the absence of detectable RNA of the hepatitis C virus in blood serum for at least 24 weeks after discontinuing the treatment[32].
Transfused Cohort	The group of approved claimants who are not haemophiliacs.
Treatment Naïve	Those claimants who have not received treatment prior to 2014. They are assumed in the medical model to be eligible for one course of treatment during the period 2014 to 2018.
Unknown claimants	Those claimants who are assumed to be approved as a class member at some date in the future.

[32] Wikipedia – "Sustained Viral Response"

Morneau Shepell Ltd.
895 Don Mills Rd.,
Tower One, Suite 700
Toronto ON M3C 1W3

Phone: (416) 445-2700
Fax: (416) 445-7989

MORNEAU SHEPELL

Gorham #4
Sworn April 8, 2015

No. C965349
Vancouver Registry

IN THE SUPREME COURT OF BRITISH COLUMBIA

BETWEEN:

ANITA ENDEAN, as representative plaintiff

PLAINTIFF

AND:

THE CANADIAN RED CROSS SOCIETY, HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA, AND THE ATTORNEY GENERAL OF CANADA

DEFENDANTS

AND:

BRITISH COLUMBIA CHILDREN'S HOSPITAL, PRINCE GEORGE REGIONAL HOSPITAL, DR. WILLIAM GALLIFORD, DR. ROBERT HART DYKES, DR. PETER HOUGHTON, DR. MICHAEL W.H. PATTERSON, DR. JACQUES GERARD LEBLANC, DR. JACOBUS KOOY, DR. JOHN DOE, HER MAJESTY THE QUEEN IN RIGHT OF CANADA, AND HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA

THIRD PARTIES

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA AND THE CANADIAN RED CROSS SOCIETY

THIRD PARTIES

AFFIDAVIT OF PETER GORHAM
(Sworn April 8, 2015)

Jasvinder S. Basran
Senior Regional Director
Department of Justice Canada
Per: Lindsay Morphy
900 – 840 Howe Street
Vancouver, British Columbia
V6Z 2S9
Telephone: (604) 666-8261
Facsimile: (604) 666-7713

Solicitor for the Defendants,
The Attorney General of Canada