

# Curriculum Vitae: Andrew Cairns

**FULL NAME:** Andrew John George CAIRNS

**NATIONALITY:** British

## WORK ADDRESS

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## EDUCATION AND POSITIONS HELD

### TERTIARY EDUCATION

1984-87	Pembroke College, Cambridge University
1987	BA in Mathematics, 1st Class
1987-90	Heriot-Watt University
1990	PhD in Statistics: Thesis entitled Epidemics in heterogeneous populations: spread, estimation and control

### EMPLOYMENT HISTORY

1990-92	Trainee Actuary, Scottish Widows Fund and Life Assurance Society
1992-2003	Lecturer, Senior-lecturer, Reader in Actuarial Mathematics and Statistics, Heriot-Watt University
2003-	Professor of Actuarial Mathematics and Statistics, Heriot-Watt University

## ACADEMIC AND PROFESSIONAL DISTINCTIONS

- Fellow of the Royal Society of Edinburgh, Scotland’s national academy of science and letters (2016)
- Corresponding Member of the Swiss Association of Actuaries (2005)  
(Equivalent to Honorary Fellowship.)

## FELLOWSHIPS, PROFESSIONAL MEMBERSHIP

- Fellow of the Royal Statistical Society (1990)
- Fellow of the Faculty of Actuaries (1993)

## HONORARY ACADEMIC APPOINTMENTS

- International Research Advisory Board, Risk and Insurance Research Center, National Cheng-Chi University, Taiwan (2014-)
- Honorary Professor, University of Edinburgh (2006-)
- Fellow of the Pensions Institute (2001-)
- Senior Research Associate, Centre for Risk and Insurance Studies, Nottingham University (2001-2012)

## PROFESSIONAL SERVICE AND COMMITMENTS

### Academic Financial Mathematics Community

- Leader of a delegation of financial maths professors to meet with Lord Adair Turner, Chairman of the Financial Services Authority: 23 September 2009.

### Actuarial, Insurance and Pensions Community

- Invited expert: US Government Accountability Office; “review of longevity in, and the distribution of income and wealth among, older households in the United States and other countries, including the UK”. (May and November 2021)
- Meeting with Dutch insurance regulators to discuss longevity risk capital charges, 21 June 2016.
- Invited panel member:
  - Audit Scotland Public Sector Pensions Audit (2010)
  - Lord Hutton Independent Public Service Pensions Commission (2011)
  - HM Treasury Discount Rate Consultation (2011)
  - Joint Royal Society of Edinburgh and Scottish Government Resilience Roundtable with the Deputy First Minister, John Swinney (2022)
- Expert advisor, Dutch Commission on the Ultimate Forward Rate (2013)
- Member, Index Oversight Committee, Life and Longevity Markets Association (2011-2018)

### Conference committees:

- Chair, organising committee, Insurance Mathematics and Economics International Colloquium, Edinburgh, 2023 (postponed from 2021).
- Co-chair, International Longevity Risk and Capital Markets Solutions Conference, 2019, 2021, 2022.
- Member, Scientific Committee: “Advances in Predictive Analytics: with applications in Insurance and Risk Management”, Workshop, U. Waterloo, 2017.
- Member, Scientific Committee of the International AFIR Colloquium, Panama, 2017.
- Member, Scientific Committee for the Actuarial Research Conference, Atlanta, 2017.
- Member, Scientific Committee, IRFRC Conference, Nanyang Technological University, Singapore, (2014, 2015, 2016).
- Member, Scientific Committee, IAA-Life/PBSS International Colloquium, Oslo, 2015 (2013-2015).
- Member, Scientific Committee, International Congress of Actuaries, Washington, 2014 (2011-2014).
- Chairman of the Scientific Committee and member of the Organising Committee for the 38th International ASTIN Colloquium, Manchester, 2008 (2006-2008).
- Chairman and main organiser of the ICMS Workshop on the Interface between Quantitative Finance and Insurance (Edinburgh) (2005)
- Co-chairman of the Scientific Committee of the joint International ASTIN/AFIR Colloquium and Chairman of the Scientific Committee of the AFIR Colloquium, Zurich, 2005 (2002-2005)

### International committee and board membership:

- Elected member of the international committee of the AFIR-ERM section of the International Actuarial Association (2009-2017); Deputy chair (2011-2013).
- Elected member of the international committee of the ASTIN section of the International Actuarial Association (2005-2013).

- Member of the ASTIN Bulletin Management Board (2010-).
- Jury member of the Fundación MAPFRE 9th International Prize – ‘Julio Castelo Matran’ – 2018.

UK professional service:

- Member of the Informatics, Mathematics and Statistics Committee, Royal Society of Edinburgh (2017-2020)
- Director of the Actuarial Research Centre, Institute and Faculty of Actuaries (2016-2020)
- Institute and Faculty of Actuaries, ST9 Syllabus Development Committee (chair) (2008-9)
- International CERA Qualification Syllabus Committee (2008-2009)
- Enterprise Risk Management Practice Executive Committee (2008-2009)
- Finance and Investment Board (Faculty of Actuaries) (2004-2008)
- Elected member of the Council of the Faculty of Actuaries (2004-2007).

## NEWSPAPER AND MEDIA FEATURES

Daily Telegraph, 26 November 2007

Life and Pensions, March 2008

FT-FM, 18 May 2008 (article)

Sunday Herald, 15 February 2009

Scotsman, 10 March, 2009 (interview)

Today, Radio 4, 15 April 2009 (live interview)

Sunday Herald, 21 September 2009 (article)

Byline Times, 11 September 2019 (quotes following interview)

Professional Pensions, 17 July 2020 (article with Kessler, Blake and Kessler)

Pensions Age, July 2020 (broader article quoting our Covid-19 work)

## EXTERNAL EXAMINING

- University College London (2011-2012)
- Warwick University (2005-2008)
- *Censor* in mathematics (financial and actuarial), Danish Universities (2002-2006)

## PhD EXTERNAL EXAMINING

Kent, Amsterdam, Imperial (2×), Louvain la Neuve, Waterloo, Georgia State, ETH Zurich, Copenhagen, City University, Lyon 1, Kaiserslautern.

## EXTERNAL APPOINTMENTS COMMITTEES

City University London, Keele, Munich, Copenhagen, Nanyang University of Technology

## RECENT TEACHING ACTIVITIES

- Risk Management Techniques and Tools (MSc and BSc level)
- Portfolio Theory (MSc and BSc level)
- Quantitative risk analysis (MSc level)
- MSc project supervision

## DEPARTMENTAL ADMINISTRATION

- Center of Actuarial Excellence: academic lead (2019-)
- Director, Actuarial Research Centre (2012-2020) (22% FTE from 2016-2020, fully funded by the Institute and Faculty of Actuaries)

- MSc in Financial Mathematics course co-ordinator (2012-2015)
- Chair, Department Teaching Committee (2007-2013)
- Co-ordination of Statistics and OR RAE 2008 submission (2007)
- Head of Department (2004-2007)
- Diploma/M.Sc. in Actuarial Science: Course Director (1994-98)

## **HERIOT-WATT UNIVERSITY ACTIVITIES**

- Member of Court (2012-2014) (Senate-elected representative)
- Member of Senate (2001-2006; 2011-2014)

## RESEARCH: GENERAL

### CURRENT AND RECENT RESEARCH INTERESTS

- Modelling, measurement and management of mortality and longevity risk; stochastic mortality modelling; securitization of mortality and longevity risk.
- Health inequalities in an ageing population.
- Cause of death analysis and links to underlying risk drivers.
- Economic and regulatory capital methods in life insurance.
- Stochastic investment and term-structure models, and their application in models for ongoing insurance portfolios including pension funds.
- Statistical modelling of corporate bond liquidity premia.

### IMPACT

- The main results in Cairns (1998) [71] were adopted by FTSE Russell in their revisions (April 2014) to how the FTSE Actuaries gilt yield indices are calculated. The new methodology achieves a better fit to daily gilt yields and is more robust than the previous yield indices methodology. Their implementation of the methodology is detailed in the FTSE Actuaries UK Gilts Index Series Ground Rules.

- REF 2014: Impact case study entitled *Stochastic models of longevity risk adopted by the pension industry*

Summary: Models developed over the period 2006-2010 are now used in the insurance and pensions industry in the UK and internationally to assess the financial risks associated with future uncertain life expectancies.

Detail: <http://results.ref.ac.uk/Submissions/Impact/46>

- REF 2021: Two impact case studies entitled:
  1. Detection of anomalies in national population and mortality data has saved the UK pensions and insurance sector over £330 million  
Summary: Statistical methodology published in 2016 has enabled actuaries and insurers to correct anomalies in UK population. The confidence gained from these corrections has allowed insurers to lower prices in bulk transfers of annuities from UK pension schemes, saving over £330 million since 2014.
  2. Models for the assessment of longevity risk adopted by regulators and the international insurance and pensions industry  
Summary: A continuation of the REF 2014 case study but with further impacts of the same type and new impacts not covered previously.
- REF 2028: Several case studies are already under development

### PhD STUDENTS

- 14 PhD students graduated (up to 2021)
- 2 PhD students currently under supervision

### EDITORSHIP

- Editor in Chief of ASTIN Bulletin – The Journal of the International Actuarial Association (2007-2017)
- Editor of ASTIN Bulletin (2000-7)
- Co-Editor of ASTIN Bulletin (1996-2000)
- Associate Editor for *Risks* (2021-)

- Associate Editor for *Insurance: Mathematics and Economics* (2013-)
- Section editor (Financial Economics) for the *Encyclopaedia of Actuarial Science* published in 2004
- Associate editor for the British Actuarial Journal (2004-2010)
- Associate editor for the Annals of Actuarial Science (2006-2011)

## GRANTS

- £33,000 per annum (2016-2020) (Principal Investigator) As Director of the Actuarial Research Centre of the Institute and Faculty of Actuaries, fully funded by the Institute and Faculty of Actuaries.
- £920,000 (2016-2020) (Principal Investigator) Research programme “Modelling, Measurement and Management of Longevity and Morbidity Risk”. Principal funding from the Institute and Faculty of Actuaries.
- £23,043 per annum (2017-18, 2018-19, renewable) Supporting funding for the project above from the Society of Actuaries (USA) and the Canadian Institute of Actuaries.
- £3,263 (2014) Travel grant from the Institute and Faculty of Actuaries to present two papers at the International Congress of Actuaries, Washington, 2014.
- EUR 54,000 (2013-16) (Co-Investigator) (part of a 500,000 euro project based in Amsterdam) “Fair risk sharing in funded pension systems” funded by Netspar.
- £33,600 (2012-2016) PhD project on banking liquidity risk, 50% sponsored by Hymans Robertson
- £68,300 (2012-2016) PhD project on the liquidity risk premium, 100% sponsored by Partnership Insurance
- £319,318 (2012-2018) to set up the Actuarial Research Centre, funding from the Institute and Faculty of Actuaries and the Faculty of Actuaries Endowment Fund.
- £1,773 (2012) Travel grant from the Institute and Faculty of Actuaries to present a paper at the IAA colloquia in Mexico City, October 2012.
- £37,717 (2010) (as co-investigator; Kleinow PI), “Mortality Models for Multiple Populations using Covariates”, funded by the Institute and Faculty of Actuaries.
- £5,000 (2005) sponsorship from Watson Wyatt, and £5,000 from the AFIR Section of the International Actuarial Association towards the cost of the Workshop on *The Interface between Quantitative Finance and Insurance*, ICMS, April 4-8, 2005.
- £4,350 (2001) (with Prof. A.D.Wilkie) awarded by the Institute of Actuaries for the development of a database of Gilts prices; for the employment of two summer students.
- £9,000 (1998) awarded by the Institute of Actuaries for investigation of market valuation techniques for pension funds; for the appointment of a research assistant.
- £6,000 (1997) awarded by the Institute of Actuaries for investigation of the construction of bond indices for European countries; for the appointment of a research assistant.
- £6,000 (1996) awarded by the Institute of Actuaries for investigation of models for the term structure of interest rates; to relieve AC from some teaching duties during 1996/97.
- £400 (1994) awarded by the British Council in Canada (Young Research Workers Scheme), towards the cost of travel to Canada in August 1994 to continue joint research with Dr Gary Parker of Simon Fraser University, British Columbia and to speak at a workshop on ‘Interest Rate Risk’.
- (1996-present) Under the editorship noted above: full expenses for attendance at editorial meetings and at the annual international AFIR colloquium.

## PRIZES

- The inaugural *Impact Prize* (2021) of the Edinburgh Mathematical Society “*in recognition of your outstanding achievements in delivering impact in actuarial sciences through the development, application and promotion of innovative models for mortality and longevity.*”
- Best paper award (Paper [7]) at the International Congress of Actuaries, Berlin, 2018.

- The 2016 Robert I. Mehr Award, The American Risk and Insurance Association presents the Robert I. Mehr Award each year for the paper published ten years ago in The Journal of Risk and Insurance that has best stood the test of time. (Paper [54] *A two-factor model for stochastic mortality with parameter uncertainty: theory and calibration.*)
- Best paper award (Paper [19]) at the International Congress of Actuaries, Washington, 2014.
- Society of Actuaries Annual Prize for the best paper published in North American Actuarial Journal for the year 2009. (Paper [42] *A quantitative comparison of stochastic mortality models using data from England and Wales and the United States.*)
- David Garrick Halmstad Prize for the best paper (Paper [50] *Pricing death: frameworks for securitization of mortality risk*) in Actuarial Science published in 2006.
- Bob Alting von Geusau Prize, sponsored by the AFIR Section of the International Actuarial Association, for the best paper (Paper [50] *Pricing death: frameworks for securitization of mortality risk*) published in ASTIN Bulletin on an AFIR-related topic in 2006.
- Highly Commended for the paper ([56] *Living with mortality*) discussed at a sessional meeting of the Institute of Actuaries during the 2005-6 session.
- Faculty of Actuaries prize for the best paper ([56] *Living with mortality*) discussed at a sessional meeting of the Faculty of Actuaries during the 2005-6 session.
- Outstanding Paper Award for the paper *A Family of Term Structure Models for Long-Term Risk Management and Derivative Pricing*, presented at the Stochastic Modelling Symposium, Canadian Institute of Actuaries, Toronto, September 2003.
- Groupe Consultatif des Associations d'Actuaires des Pays des Communautés européennes: Joint first prize for a paper by a young actuary in the field of 'Interest Risk in Insurance and Pensions'; presented at the 10th Colloquium of the Groupe Consultatif in Barcelona, September 1997.
- Highly Commended by the Council of the Institute of Actuaries for the papers 71 and 72 on bond yield modelling.
- Highly Commended by the Council of the Institute of Actuaries for the paper 68 on pension-fund valuation.

Recent clients include:

- Société Générale Corporate and Investment Banking  
Conduct and publish research on longevity risk hedging and economic capital
- Partnership Life Assurance Company Ltd  
Expert advice on credit risk and yield curves methodology
- Canada Pension Plan Investment Board  
Academic audit of ALM research
- J.P.Morgan (ALM Advisory, Global Pensions Team)  
Longevity risk research; LifeMetrics Advisory Board member
- Jenner and Block LLP (US lawyers) and General Motors  
Expert advice on yield curve methodology
- Distribution Technology (UK financial software provider)  
Expert advice on economic scenario generators
- AON Consulting (international benefits consultancy) ALM research

## RESEARCH: SHORT COURSES, WORKSHOPS AND CONFERENCES

### SUMMER SCHOOLS AND SHORT COURSES

- 'Stochastic mortality models',  
Invited lecture series at the Corvinus University, Budapest, 1-3 October, 2019.
- 'Modelling and Management of Mortality Risk',  
IIR Masterclass on Longevity Risk, Amsterdam, 23-24 June, and 5-6 July, 2010.

- ‘Mortality Modelling and Risk Management’, ARAB-KVBM Chair, Brussels, 18 and 25 May, 2009
- ‘Interest Rate Models’, Milan, November 2007.
- ‘Equity and Interest Rate Models: Theory and Applications’, International Summer School, Lausanne, August, 2004, organised by the Swiss Actuarial Association.

## WEBINARS AND VIRTUAL CONFERENCES

- Mortality improvement models using detailed cause of death data, HMD Conference, Paris and online, October 2022  
**(Invited speaker)**
- Socio-Economic Differences in Mortality and Longevity, Convention A, online conference for the international actuarial community, September 2022  
**(Invited plenary speaker)**
- ‘Covid-19: Its Evolving Impact on Mortality’, 17th International Longevity Risk and Capital Markets Solutions Conference, University of Waterloo, September 2022  
(Contributed talk)
- ‘The Impact of Covid-19 on Higher-Age Mortality’, Actuarial Society of South Africa, ERM Seminar, August 2022  
**(Keynote speaker, 68 participants)**
- ‘A General Framework for Analysing the Mortality Experience of a Large Portfolio of Lives: With an Application to the UK Universities Superannuation Scheme’ European Actuarial Journal Zoom Session, June 2022  
**(Invited speaker)**
- ‘The Evolving Dynamics of Covid-19: Lessons For Mortality Risk Measurement and Management’, Virtual ASTIN AFIR/ERM Colloquium, June 2022  
(Contributed talk)
- ‘A General Framework for Analysing the Mortality Experience of a Large Portfolio of Lives: With an Application to the UK Universities Superannuation Scheme’ Lane Clark and Peacock, in house webinar, June 2022.  
**(Invited speaker)**
- ‘Levelling up — The great health challenge’, Lane Clark and Peacock, in house webinar, June 2022.  
(Joint presentation with Les Mayhew, and Mei Sum Chan.)
- The Evolving Dynamics of Covid-19: Lessons For Mortality Risk Measurement and Management, ASTIN/AFIR-ERM Colloquium, June 2022  
(Contributed talk)
- Cohort Effects in US Cause-of-Death Mortality Data, IAA Colloquium, Hong Kong/virtual, April 2022  
(Contributed talk)
- ‘Cohort Effects in US Cause-of-Death Mortality’ Webinar, University of Illinois Urbana-Champaign, March 2022  
**(Invited speaker)**
- ‘The Impact of Covid-19 on Higher-Age Mortality’, Workshop: Emerging Insights in Insurance Statistics, Banff International Research Station for Mathematical Innovation and Discovery, Banff, Canada, 16-21 January 2022.  
**(Keynote speaker)** (Conference cancelled due to Covid)
- ‘Mortality inequality: What insights can we gain from analysis of cause-of-death mortality data?’, ARC Webinar series, 21 October 2021. **(Invited speaker)**
- ‘The Impact of Covid-19 on Higher-Age Mortality’, IAA Colloquium (IAALS), 12 October 2021,  
**(Keynote speaker, 65 participants.)**



- ‘What lessons can we learn from the COVID-19 pandemic?’, 16th International Longevity Risk and Capital Markets Solutions Conference, Denmark, 13-14 September 2021  
(Contributed talk)
- ‘Cohort effects in US Cause-of-Death mortality data’, 16th International Longevity Risk and Capital Markets Solutions Conference, Denmark, 13-14 September 2021  
(Contributed talk)
- ‘Research Frontiers in Risk and Insurance’, Insurance Mathematics and Economics Congress, 5-9 July 2021,  
**(Invited panellist)**
- ‘Looking Forward, What Lessons can we Learn from the COVID-19 Pandemic?’, Insurance Mathematics and Economics Congress, 5-9 July 2021,  
(Contributed talk)
- ‘Introducing the new Longevity Index For England (LIFE) App’,  
ARC Webinar Series, 23 June 2021,  
(Main speaker with Torsten Kleinow, 160 participants.)
- ‘The Impact of Covid-19 on Higher-Age Mortality’,  
Actuarial Teaching and Research Conference organised by University College Dublin, 15 June 2021,  
(Contributed talk, 40 participants.)
- ‘The Impact of Covid-19 on Higher-Age Mortality’,  
Covid-19 conference, Université Paris XIII, 31 May 2021.  
**(Invited speaker**, 40 participants.)
- ‘The Impact of Covid-19 on Future Higher-Age Mortality’,  
Institute of Actuaries in Belgium, May 2021.  
**(Invited speaker**, 20 participants.)
- ‘The Impact of Covid-19 on Future Higher-Age Mortality’,  
Luxembourgish Institute of Actuaries, March 2021.  
**(Invited speaker**, 70 participants.)
- ‘What insights can we gain from analysis of cause-of-death mortality data?’,  
Yorkshire Actuarial Society & University of York Actuarial Webinars, February 2021.  
**(Invited speaker)**
- ‘The Impact of Covid-19 on Future Higher-Age Mortality’,  
French Institute of Actuaries, November 2020.  
**(Invited speaker**, over 220 participants + 49 YouTube views.)
- ‘The Impact of Covid-19 on Future Higher-Age Mortality’,  
Fasano Annual Conference, November 2020.  
**(Invited speaker)**
- ‘The Impact of Covid-19 on Future Higher-Age Mortality’,  
Geneva Association Health and Ageing Conference 2020, October 2020.  
**(Invited speaker)**
- ‘The Impact of Covid-19 on Future Higher-Age Mortality’,  
AXA Chief Actuaries’ Webinar, October 2020).  
**(Invited speaker)**
- ‘The Impact of Covid-19 on Future Higher-Age Mortality’,  
Longevity Science Panel (Legal and General mortality advisory group), September 2020.  
**(Invited speaker)**
- Covid-19 Webinar (Panellist),  
Government Actuary’s Department, Covid-19 webinar, August 2020.  
**(Invited speaker)**
- ‘The Impact of Covid-19 on Future Higher-Age Mortality’,  
LIMRA (Life Insurance Market Research Association), July 2020.  
**(Invited speaker**; mainly US chief actuaries and chief risk officers; over 80 participants.)
- ‘The Impact of Covid-19 on Future Higher-Age Mortality’,  
SCOR Knowledge Team, 9 June 2020. **(Invited speaker)**
- ‘The Impact of Covid-19 on Future Higher-Age Mortality’,  
Prudential Retirement, international webinar, May 2020.  
**(Invited speaker**; over 500 participants worldwide.)

- ‘Big Data and Socio-Economic Mortality’,  
Actuarial Research Centre Webinar, Institute and Faculty of Actuaries, July 2019.
- ‘Modelling, Measurement and Management of Longevity and Morbidity Risk’,  
Actuarial Research Centre Webinar, Institute and Faculty of Actuaries, May 2017.

## INTERNATIONAL WORKSHOPS

- “Medium Data and Socio-Economic Mortality”,  
Mathematics in Longevity Risk Management workshop, London, June 2019.  
(Invited speaker.)
- “Medium data and socio-economic mortality”,  
SFRA Workshop on Data Science, Edinburgh, February 2019.
- “Developments in Mortality Modelling”,  
Swiss Risk and Insurance Forum: *Old-Age Provision: Past, Present, Future*, Zurich, November 2015  
(Invited speaker.)
- “Robust hedging of longevity risk”,  
University of Hannover, April 2012  
(Invited speaker.)
- “Robust hedging of longevity risk”,  
University of Lausanne, March 2012  
(Invited speaker.)
- ‘Modelling multi-population mortality’,  
Oslo CMA workshop: *Insurance mathematics and longevity risk*, Oslo, May, 2009.  
(Invited speaker.)
- ‘A Market Model for Stochastic Mortality’,  
Workshop: *The Mathematics and Statistics of Quantitative Risk Management*,  
Oberwolfach, Germany, March, 2008.  
(Invited participant and speaker.)
- Workshop: *ICMS* Edinburgh, July, 2007. (Member of the organising committee.)
- ‘A multifactor generalisation of the Olivier-Smith model for stochastic mortality’,  
Workshop: *Financial Engineering for Actuarial Mathematics*,  
Michigan State University, May, 2007.  
(Invited speaker.)
- ‘Models for stochastic mortality with parameter uncertainty’  
Workshop: *Integrated risk modelling*,  
Tilburg, Netherlands, April, 2007.
- ‘A multifactor generalisation of the Olivier-Smith model for stochastic mortality’,  
Workshop: *Recent Developments in Financial and Insurance Mathematics and the Interplay with Industry*,  
Oberwolfach, Germany, March, 2007.  
(Invited speaker.)
- ‘Models for Stochastic Mortality with Parameter Uncertainty’  
Workshop: *Longevity risk and securitization*,  
Université Catholique de Louvain, Belgium, November 2006.  
(Invited speaker.)
- Workshop: *ICMS* Edinburgh, April, 2005. (Chairman of the organising committee.)
- ‘A Family of Term Structure Models with Stochastic Volatility’,  
Workshop: *Interest Rates*,  
Isaac Newton Institute, Cambridge, March, 2005.  
(Invited speaker.)
- ‘Pricing Frameworks for Securitisation of Mortality Risk’,  
Workshop: *Risk Management*,  
Isaac Newton Institute, Cambridge, March, 2005.  
(Invited speaker.)

- ‘Optimal Asset Allocation for Defined Contribution Pension Plans’,  
Workshop: *Stochastics For Risk, Insurance And Finance*,  
London School of Economics, December, 2002.  
(Invited speaker.)
- ‘A multifactor, term-structure model for long-term risk management’,  
Workshop: *Finance and Insurance*,  
Stockholm, June, 2001.  
(Invited speaker.)
- ‘Pensionmetrics: optimal dynamic asset allocation for defined-contribution pensions’,  
Workshop: *Stochastic Analysis in Finance and Insurance*,  
Oberwolfach, Germany, May, 2000.  
(Invited speaker.)
- ‘Dynamic stochastic control of pension funds’,  
Workshop: *Risk Theory*,  
Oberwolfach, Germany, September, 1999.  
(Invited speaker.)
- ‘A multifactor model for the term structure of interest rates’,  
Workshop: *Mathematical Finance*,  
Edinburgh, July, 1999.  
(Contributed talk.)
- Workshop: *The Interplay Between Finance, Insurance and Statistics*,  
Cortona, Italy, June, 1998.  
(Invited participant.)
- ‘Some results on continuous-time pension fund models’,  
Workshop: *The Interaction Between Control, Finance and Insurance*,  
Aarhus, Denmark, February, 1997.  
(Contributed talk.)
- ‘A practical approach to model fitting and projection’,  
Workshop: *NATO Advanced Research Workshop on Epidemic Models*,  
Cambridge, January, 1993.  
(Invited speaker.)
- ‘Estimation and projection of the AIDS epidemic’,  
Workshop: *Spread of Epidemics: Stochastic Modelling and Data Analysis*, Skokloster, Sweden,  
August 1990.  
(Invited speaker.)

## INVITED SPEAKER AT INTERNATIONAL/UK CONFERENCES etc

- ‘The Impact of Covid-19 on Higher-Age Mortality’,  
7th International Pension Research Association Conference, OECD Paris, June 2022  
(hosted by the OECD Pensions Division and attended by around 100 national pensions supervisors and regulators).
- ‘US Mortality: Underlying Trends By Socioeconomic Group and Cause of Death’,  
Society of Actuaries Annual Meeting, Toronto, Canada, October 2019.
- ‘US Mortality: Underlying Trends By Socioeconomic Group and Cause of Death’,  
Actuarial Research Conference, Purdue University, Indianapolis, USA, August 2019.
- ‘Modelling Socio-Economic Differences in the Mortality of Danish Males Using a New Affluence Index.’,  
PeRCent Annual Conference 2019, Copenhagen, May 2019.
- ‘Cause of Death Mortality: International Trends by Socio-Economic Group’,  
Society of Actuaries Annual Meeting, Nashville, October 2018.
- ‘Longevity Trends, Past and Future: A Deep Dive into CPP and QPP Mortality’,  
Canada Pension Plan Triennial Seminar, Ottawa, September 2018.
- ‘Trends in Mortality by Pension Level: Evidence from the CPP and QPP’,  
Canadian Institute of Actuaries Annual Meeting, Toronto, June 2018.

- ‘Still living with mortality: the longevity risk transfer market after one decade’, Institute and Faculty of Actuaries, Sessional Research Meeting, Edinburgh, January 2018.
- ‘Modelling Socio-Economic Differences in the Mortality of Danish Males Using a New Affluence Index’, LoLitA Closing Conference, Paris, January 2018.
- ‘Living to 100: Mortality Modelling – Modelling, Measurement and Management of Longevity Risk’, Society of Actuaries Annual Meeting, Boston, October 2017.
- ‘(International) Developments in Actuarial Mortality Research’, Current Developments in Ageing and Mortality, Budapest, April 2017.
- ‘IFoA International Research in Mortality’, IAA Mortality Working Group, Budapest, April 2017.
- ‘The Impact of Longevity Risk Hedging on Economic Capital’, Actuarial Teachers and Research Conference, University of East Anglia, July 2016.
- ‘IFoA Actuarial Research’, Insurance Risk and Finance Research Conference, Nanyang Technological University, Singapore, June 2016.
- Modelling and Management of Longevity Risk, SCOR Actuarial Seminar, Paris, May 2015
- ‘Multi-population Mortality Modelling’ Risk Minds Insurance, Amsterdam, March 2015
- ‘Securitization and Hedging of Longevity Risk’, AFMath, Brussels, February 2015.
- ‘Multi-population Mortality Modelling’, PARTY 2015 Conference, Liverpool, January 2015.
- ‘Multi-population Mortality Modelling’, European Actuarial Journal Conference, Vienna, September 2014.
- ‘Robust Hedging of Longevity Risk’, Insurance Risk and Finance Research Conference, Nanyang Technological University, Singapore, June 2014.
- ‘Robust Hedging of Longevity Risk’, National Chengchi University, Taiwan, June 2014.
- ‘Modelling the Liquidity Risk Premium on Corporate Bonds’, Institute and Faculty of Actuaries, Sessional Discussion Meeting, London, May 2014.
- ‘Modelling Longevity Risk’, Risk Minds Insurance, Amsterdam, March 2014
- ‘Phantoms Never Die: Living with Unreliable Mortality Data’, US Social Security Administration, Baltimore, December 2013.
- ‘Phantoms Never Die: Living with Unreliable Mortality Data’, United Nations Population Directorate, New York, December 2013.
- ‘Phantoms Never Die: Living with Unreliable Mortality Data’, Institutional Investor Breakfast Meeting, New York, December 2013.
- ‘Robust Modelling and Management of Longevity Risk’, International Cramér Symposium on Insurance Mathematics, Stockholm University, June 2013.
- ‘Modelling and Management of Longevity Risk’, 2013 Retirement Risk Conference, Wharton School, USA, April 2013.
- ‘Robust Modelling and Management of Longevity Risk’, 8th International Conference On Longevity Risk And Capital Market Solutions, Toronto, September 2012. Keynote invited speaker.
- ‘Modelling and robust risk management of longevity risk’, Longevity Masterclass, Risk Minds Insurance, Geneva, February 2012.
- ‘Projecting Life Expectancy: An actuarial perspective’, Conference on Projecting life expectancy, Rotterdam, November 2011. Keynote speaker.
- ‘Hedging longevity risk: a forensic, model-based analysis and decomposition of basis risk’, Conference on Longevity and Pension Funds, Institut Louis Bachelier, Paris, February 2011

- ‘Understanding and managing pension risks with a focus on longevity risk’, OECD-WPC Pensions and Investment Forum, December 2010.
- ‘Mathematical models and the credit crunch’, 25th International Congress of Actuaries, Cape Town, March 2010.
- ‘Global Issues in ERM’ (invited speaker and panellist), 25th International Congress of Actuaries, Cape Town, March 2010.
- ‘Modelling multi-population mortality with cohort effects’, *Joining Forces on Mortality and Longevity Conference*, Edinburgh, September, 2009.
- Stochastic multi-population mortality models , Invited keynote speaker, Portuguese Statistical Society, 17th Annual Conference, September 2009
- ‘Hedging longevity risk using mortality forwards’, 25th Nordic and 1st British-Nordic congress of Mathematicians, Oslo, June 2009.
- ‘Modelling and Management of Mortality Risk’ Keynote speaker, Danish Actuarial Society Mortality Workshop, December 2008.
- ‘Backtesting of Stochastic Mortality Models’ Insurance-Linked Securities Workshop, Imperial College Business School, October 2008
- ‘Pricing Death: Pricing Frameworks for Securitization of Mortality Risk’ 18th International AFIR Colloquium, Rome, October 2008.
- ‘The Cairns-Blake-Dowd Model’ Faculty and Institute of Actuaries conferences on Mortality and Longevity, Edinburgh and London, April 2008.
- ‘Stochastic Mortality Models: Criteria for Assessing and Comparing Models’ Longevity Risk Conference, Paris, February 2008.
- ‘Risk analysis and pricing of longevity-linked securities’ IIR Conference on Life Settlements and Longevity Risk, Amsterdam, December 2007.
- ‘A new look at mortality risk’ with D. Blake and K. Dowd; UK Life Convention, November 2007.
- ‘Models for stochastic mortality’, 56th Session of the International Statistical Institute, Lisbon, August 2007.
- ‘Mortality risks for life insurers and pension funds’ Conference on Financial Innovation for Societal Risks, Zurich, May, 2007.
- ‘Models for stochastic mortality with parameter uncertainty’ DAV and DGVM Scientific Day, Berlin, April, 2007.
- ‘Models for stochastic mortality with parameter uncertainty’ Cherry Bud Workshop, Yokohama, Japan, March, 2007.
- ‘Stochastic Mortality’ Life Convention, Glasgow, November 2006.
- ‘Optimal Dynamic Asset Allocation for Defined Contribution Pension Plans’ Conference on Numerical Methods for Finance, Dublin, June, 2006.
- ‘A two-factor model for stochastic mortality with parameter uncertainty”, Joint event: Second International Conference On Longevity Risk And Capital Market Solutions, Chicago, April, 2006, and the Bowles Symposium 2006.
- ‘A family of term structure models with stochastic volatility’, Oslo University “Workshop on Mathematical Finance and Insurance”, September 2005.
- ‘Mortality is alive and kicking’, Oslo University “Workshop on Mathematical Finance and Insurance”, September 2005.
- ‘Modelling Longevity Risk’, OECD, 76th Session of the Insurance and Private Pensions Committee, Paris, December 2005.
- ‘DC Pension Plans: the Impact of Financial Risk on Individuals and on Population Dynamics’, 9th International Congress on Insurance: Mathematics and Economics, Quebec, July, 2005. (Opening plenary speaker.)
- ‘Longevity Bonds and Mortality-Linked Securities’, Swiss Actuarial Society Annual Meeting, Basel, June, 2005. (Keynote speaker)

- ‘Modelling the Mortality Term Structure’,  
First International Conference On Longevity Risk And Capital Market Solutions, London, February, 2005.
- ‘Stochastic Lifestyling: Optimal Asset Allocation for DC Pension Plans’,  
International Symposium on Asset Allocation and Pension Management, Copenhagen, November, 2004.
- ‘Stochastic lifestyling: optimal dynamic asset allocation for defined contribution pension plans’,  
AXA European Pension Seminar, Suduiraut, Bordeaux, June, 2004.  
(Keynote speaker)
- ‘Stochastic pension plan design and VaR during the accumulation and distribution phases’,  
Joint Q-group and Inquire UK and Europe meeting, Versailles, May, 2004.
- ‘A family of term-structure models for long-term risk management and derivative pricing’,  
Stochastic Modelling Workshop, Canadian Institute of Actuaries, Toronto, September 2003.
- ‘Guaranteed Annuity Options’,  
Swiss Actuarial Society Annual Meeting, Geneva, September 2003.
- ‘Parameter and Model Uncertainty in Insurance Risk Modelling’,  
UK ASTIN Meeting 2003, London, April, 2003.
- ‘Pensionmetrics II: stochastic pension plan design during the distribution phase’,  
Design and Workings of Defined Contribution Pension Plans Conference, LSE and UBS Pensions  
Research Programme, London, September, 2002.
- ‘Pricing and hedging of guaranteed annuity options’,  
Interest-Rate Guarantees for Life and Pensions-Insurance Contracts Seminar, Oslo, November, 2001.
- ‘Managing the risks of DC pension plans’,  
International Pensions Seminar, Brighton, June, 2001.
- ‘Fair valuation of liabilities: equilibrium versus risk-minimising prices’,  
Groupe Consultatif meeting, Copenhagen, June, 2001.
- ‘Stochastic pension plan design during the distribution phase’,  
(with D.Blake and K.Dowd) 4th Annual BSI Gamma Foundation conference on Global Asset Man-  
agement, Rome, October, 2000.
- ‘A multifactor model for the term structure and inflation for long-term risk management’, British  
Applied Mathematics Colloquium, Manchester, June, 2000.
- ‘Stochastic pension scheme design and value at risk’,  
(with D.Blake and K.Dowd) 3rd Annual BSI Gamma Foundation conference on Global Asset Man-  
agement, Lugano, Switzerland, November, 1999.
- ‘Optimal control of stochastic pension funds’,  
10th INFORMS Applied Probability Conference, Ulm, Germany, July, 1999.
- ‘Risk management for pension funds’,  
International Congress for Industrial and Applied Mathematics, Edinburgh, July, 1999.
- ‘Stochastic methods for pension plan valuations’,  
Society of Actuaries 1998 Spring Meeting, Health and Pension, Hawaii, June 1998.
- ‘Stability of descriptive models for the term structure of interest rates’,  
Groupe Consultatif meeting, Barcelona, September, 1997.
- ‘Pensions Research Carried Out in the Universities’,  
Meeting of Pensions Researchers, Institute of Actuaries, February, 1996.
- ‘Practical Application of Stochastic Pension Fund Models’,  
Harrogate Pensions Convention, September, 1995.
- ‘An introduction to stochastic pension plan modelling’,  
Workshop on Interest Rate Risk, Simon Fraser University, British Columbia, August, 1994.
- ‘Primary components of epidemic models’,  
20th European Meeting of Statisticians, Bath University, September 1992.

## CONTRIBUTED PAPERS/TALKS AT INTERNATIONAL and UK CONFERENCES

- ‘Levelling up — The great health challenge’,  
Institute and Faculty of Actuaries Conference, London, June 2022.  
(Joint presentation with Les Mayhew, and Mei Sum Chan.)
- ‘Index based longevity hedging as a practical risk mitigation tool for deferred pension liabilities’,  
Institute and Faculty of Actuaries, Life Conference, Dublin, November 2019.
- ‘How neighbourhood characteristics can predict your longevity’,  
Institute and Faculty of Actuaries, Life Conference, Dublin, November 2019.
- ‘How Neighbourhood Characteristics can Predict Your Longevity’,  
International Longevity Risk and Capital Markets Solutions Conference, Washington, September 2019.
- ‘Index Based Longevity Hedging as a Practical Risk Mitigation Tool for Deferred Pension Liabilities’,  
International Longevity Risk and Capital Markets Solutions Conference, Washington, September 2019.
- ‘Medium Data and Socio-Economic Mortality’,  
Insurance Data Science Conference, ETH Zurich, June 2019.
- ‘Big Data and Socio-Economic Mortality’,  
IFoA Pensions Conference, Bristol, June 2019.
- ‘Index Based Longevity Hedging – The Dutch experience to date and challenges for the future’,  
IFoA Life Conference, Liverpool, November 2018. (Joint with Alan Rae.)
- ‘Cause of Death Mortality: International Trends by Socio-Economic Group’,  
IFoA Life Conference, Liverpool, November 2018.
- ‘Cause of Death Mortality: International Trends by Socio-Economic Group’,  
14th International Longevity Risk and Capital Markets Solutions Conference, Amsterdam, September 2018.
- ‘How Big An Impact Does Socio-economic Status Have On Cause Of Death Rates?’,  
International Congress of Actuaries, Berlin, April 2018.
- ‘Assessing the Economic Impact of Longevity Hedges’,  
International Congress of Actuaries, Berlin, April 2018.
- ‘Longevity Risk Research: Modelling, Measurement and Management of Longevity and Morbidity Risk’,  
IFoA Life Conference, Birmingham, November 2017.
- ‘The Impact of Longevity Risk Hedging on Economic Capital’,  
IAALS Colloquium, Barcelona, October 2017.
- ‘A Flexible and Robust Approach to Modelling Single Population Mortality’,  
13th International Longevity Risk and Capital Markets Solutions Conference, Taipei, September 2017.
- ‘Socio-Economic Differences in Mortality by Cause of Death’,  
13th International Longevity Risk and Capital Markets Solutions Conference, Taipei, September 2017.
- ‘Modelling Socio-Economic Differences in the Mortality of Danish Males Using a New Affluence Index’,  
ASTIN/AFIR-ERM Colloquium, Panama City, August 2017.
- ‘Basis Risk in Index Based Longevity Hedges: A Guide For Longevity Hedgers’  
12th International Longevity Risk and Capital Markets Solutions Conference, Chicago, September 2016.
- ‘Forecasting Socio-Economic Differences in the Mortality of Danish Males’,  
International Mortality and Longevity Symposium, London, September 2016.
- ‘The Impact of Longevity Risk Hedging on Economic Capital’,  
Insurance Risk and Finance Research Conference, Nanyang Technological University, Singapore, June 2016.
- ‘The Impact of Longevity Risk Hedging on Economic Capital’,  
International AFIR-ERM Colloquium, Edinburgh, June 2016.

- ‘Multi-population Mortality Modelling’  
11th International Longevity Risk and Capital Markets Solutions Conference, Lyons, September 2015.
- ‘Multi-population mortality modelling: hedging longevity risk and basis risk’,  
Pensions Conference, Glasgow, June 2015.
- ‘Multi-population Mortality Modelling’  
IAA-Life/PBSS Conference, Oslo, June 2015.
- ‘Phantoms Never Die: Living with Unreliable Mortality Data’,  
Life Conference and Exhibition, Birmingham, November 2014.
- ‘Phantoms Never Die: Living with Unreliable Mortality Data’,  
International Mortality and Longevity Symposium, Birmingham, September 2014.
- ‘Modelling the Liquidity Risk Premium on Corporate Bonds’,  
Risk and Investment Conference, Glasgow, June 2014.
- ‘Modelling the Liquidity Risk Premium on Corporate Bonds’,  
International Congress of Actuaries, Washington, April 2014.
- ‘Recent Developments in the Modelling of Longevity Risk’,  
International Congress of Actuaries, Washington, April 2014.
- ‘Mortality Modelling: Living with Unreliable Data’,  
9th International Longevity Risk and Capital Markets Solutions Conference, Beijing, September 2013.
- ‘Modelling and Management of Longevity Risk’,  
23rd International AFIR Colloquium, Lyons, June 2013.
- ‘New Directions in the Modelling of Longevity Risk’,  
UK Life Conference, Brussels, November 2012.
- ‘New Directions in the Modelling of Longevity Risk’,  
IAA Life Colloquium, Mexico City, October 2012.
- ‘Decomposing hedge effectiveness in longevity hedges’,  
21st International AFIR Colloquium, Madrid, June 2011.
- ‘Hedging longevity risk: a forensic, model-based analysis and decomposition of basis risk’,  
Longevity 6 conference, Sydney, September 2010.
- Bayesian Stochastic Mortality Modelling for Two Populations,  
Longevity 5 conference, New York, September 2009.
- Bayesian Stochastic Mortality Modelling for Two Populations,  
3rd International IAA-Life Colloquium, Munich, September 2009.
- Mathematical Models and the Credit Crunch,  
19th International AFIR Colloquium, Munich, September 2009.
- ‘Modelling and Management of Mortality Risk’  
18th International AFIR Colloquium, Rome, October 2008.
- ‘A Multifactor Generalisation of the Olivier-Smith Model for Stochastic Mortality’,  
1st IAA Life Colloquium, Stockholm, July 2007.
- ‘DC Pension Plans For All: What If?’,  
(with B.J. MacDonald) 14th International AFIR Colloquium, Zurich, September, 2005.
- ‘Pricing Frameworks for Securitization of Mortality Risk’,  
13th International AFIR Colloquium, Boston, November, 2004.
- ‘A Family Of Term-structure Models with Stochastic Volatility’,  
Bachelier Finance Society 3rd World Congress, Chicago, July, 2004.
- ‘A Family Of Term-structure Models with Stochastic Volatility’,  
35th International ASTIN Colloquium, Bergen, June, 2004.
- ‘Pensionmetrics II: Stochastic pension plan design during the distribution phase’,  
12th International AFIR Colloquium, Maastricht, September, 2003.
- ‘A family of models for the term-structure of interest rates: an application to guaranteed annuity options’,  
6th International Congress on Insurance, Mathematics and Economics, Lisbon, July, 2002.
- ‘Models for the rate of inflation, equity dividend yields and dividend growth using the Kalman filter technique’, (with Zainudin Arsad)  
6th International Congress on Insurance, Mathematics and Economics, Lisbon, July, 2002.



- ‘Valuation and hedging of LPI liabilities’, (with Hong-Chih Huang)  
6th International Congress on Insurance, Mathematics and Economics, Lisbon, July, 2002.
- ‘From financial economics to fair value’,  
11th AFIR Colloquium, Toronto, September, 2001.
- ‘Optimal dynamic asset allocation for defined-contribution pension plans’,  
10th AFIR Colloquium, Tromsø, June, 2000.
- ‘A multifactor, equilibrium model for the term structure and inflation’,  
9th AFIR Colloquium, Tokyo, Japan, August, 1999.
- ‘Stability of descriptive models for the term structure of interest rates’,  
Conference on Quantitative Methods in Finance, Cairns, August, 1997.
- ‘A comparison of optimal and dynamic control strategies for continuous-time pension plan models’,  
7th AFIR International Colloquium, Cairns, August, 1997.
- ‘Continuous-time pension fund modelling’,  
6th AFIR International Symposium, Nuremberg, October, 1996.
- ‘Modelling bond yield and forward rate curves for the FT Actuaries British Government Securities Yield Indices’,  
6th AFIR International Symposium, Nuremberg, October, 1996.
- ‘Modelling bond yield and forward rate curves for the FT Actuaries British Government Securities Yield Indices’,  
Investment Conference, Langley, June, 1996.
- ‘Parameter and model risk in stochastic investment modelling’,  
Investment Conference, Langley, June, 1996.
- ‘Pension funding in a stochastic environment: the role of objectives in selecting an asset allocation strategy’,  
5th AFIR International Symposium, Brussels, September, 1995.
- ‘Uncertainty in the modelling process’,  
25th International Congress of Actuaries, Brussels, September, 1995.
- ‘Uncertainty in the modelling process’,  
Actuarial Teachers Meeting, July, 1995.
- ‘Uncertainty in the modelling process’,  
29th Actuarial Research Conference, Oregon State University, Corvallis, Oregon, August, 1994.
- ‘Epidemic estimation with removal time data’,  
2nd World Congress of the Bernoulli Society, Uppsala, Sweden, August 1990.
- ‘Growth and control of heterogeneous epidemics as a function of  $R_0$ ’,  
5th IMA Conference on ‘The Mathematical Theory of the Dynamics of Biological Systems’, Keble College, Oxford, July 1989.

## RESEARCH: BIBLIOGRAPHY

### Submitted papers

1. ...

### Refereed journal articles etc.

2. Cairns, A.J.G., Blake, D., Dowd, K., Coughlan, G.D., Jones, O., and Roney, J. (2022) A General Framework for Analysing the Mortality Experience of a Large Portfolio of Lives: With an Application to the UK Universities Superannuation Scheme. To appear in *European Actuarial Journal* 12: xxx-yyy. DOI: 10.1007/s13385-022-00309-1. Published online 29 April 2022.
3. Arik, A., Streftaris, G., Dodd, E. and Cairns, A.J.G. (2021) Socioeconomic disparities in cancer incidence and mortality in England and the impact of age-at-diagnosis on cancer mortality. *PLOS One*, 16(7): e0253854.
4. Blake, D., and Cairns, A.J.G. (2021) Longevity Risk and Capital Markets: The 2019-20 Update. *Insurance: Mathematics and Economics*, 99: 395-431.
5. Redondo Lourés, C., and Cairns, A.J.G. (2021) Cause of death specific cohort effects in U.S. mortality. *Insurance: Mathematics and Economics*, 90: 190-199. DOI: 10.1016/j.insmatheco.2021.03.026
6. Wen, J., Cairns, A.J.G., and Kleinow, T. (2021) Fitting Multi-Population Mortality Models to Socio-Economic Groups *Annals of Actuarial Science*, 15: 144-172.
7. Cairns, A.J.G., and El Boukfaoui, G. (2021) Basis Risk in Index Based Longevity Hedges: A Guide For Longevity Hedgers. *North American Actuarial Journal* 25(sup1): S97-S118. DOI:10.1080/10920277.2019.1651658
8. Dowd, K., Cairns, A.J.G., and Blake, D. (2021) Hedging Annuity Risks with the Age-Period-Cohort Two-Population Gravity Model. *North American Actuarial Journal* 25(Sup1): S170-S181. DOI:10.1080/10920277.2019.1652102
9. Dowd, K., Cairns, A.J.G., Blake, D. (2020) CBDX: A New Workhorse Mortality Model from the Cairns-Blake-Dowd Family To appear in *Annals of Actuarial Science*, 14: 445-460.
10. Redondo Lourés, C., and Cairns, A.J.G., (2020) Mortality In The US By Education Level. *Annals of Actuarial Science* 14: 384-419.
11. Wen, J., Kleinow, T., and Cairns, A.J.G. (2020) Trends in Canadian Mortality By Pension Level: Evidence From the CPP and QPP. *North American Actuarial Journal*, 24: 533-561. DOI:10.1080/10920277.2019.1679190
12. Cairns, A.J.G., Kallestrup-Lamb, M., Rosenskjold, C.P.T., Blake, D., and Dowd, K., (2019) Modelling Socio-Economic Differences in the Mortality of Danish Males Using a New Affluence Index. *ASTIN Bulletin* 49: 555-590. . DOI: 10.1017/asb.2019.14
13. Blake, D., Cairns, A.J.G., Dowd, K., and Kessler, A.R. (2019) Still living with mortality: the longevity risk transfer market after one decade Presented at a Sessional Research Meeting of the Institute and Faculty of Actuaries, Edinburgh, 29 January, 2018. *British Actuarial Journal* 24: 1-80. DOI: 10.1017/S1357321718000314
14. Mavros, G., Cairns, A.J.G., Kleinow, T., and Streftaris, G. (2017) Stochastic Mortality Modeling: Key Drivers and Dependent Residuals. *North American Actuarial Journal*, 21: 343-368. DOI: 10.1080/10920277.2017.1286992
15. Chen, L., Cairns, A.J.G., and Kleinow, T. (2017) Small population bias and sampling effects in stochastic mortality modelling. *European Actuarial Journal*, 7: 193-230. DOI: 10.1007/s13385-016-0143-x
16. Enchev, V., Cairns, A.J.G., and Kleinow, T. (2017) Multi-population mortality models: Fitting, Forecasting and Comparisons. *Scandinavian Actuarial Journal*, 2017: 319-342. DOI: 10.1080/03461238.2015.1133450
17. Cairns, A.J.G., Blake, D., Dowd, K., and Kessler, A. (2016) Phantoms Never Die: Living with Unreliable Population Data. *Journal of the Royal Statistical Society, Series A*, 179: 975-1005. DOI: 10.1111/rssa.12159

18. Dowd, D., Blake, D., and Cairns A.J.G. (2016) The Myth of Methuselah and the Uncertainty of Death: The Mortality Fan Charts. *Risks*, 4: 21.  
DOI: 10.3390/risks4030021
19. van Loon, P.R.F., Cairns, A.J.G., McNeil, A.J., and Veys, A. (2015) Modelling the Liquidity Premium on Corporate Bonds. *Annals of Actuarial Science*, 9: 264-289.  
DOI: 10.1017/S1748499514000347
20. Karabey, U., Kleinow, T., and Cairns, A.J.G. (2014) Factor risk quantification in annuity models. *Insurance: Mathematics and Economics*, 58: 34-45.  
DOI: 10.1016/j.insmatheco.2014.06.004
21. Sahin, S., Cairns, A.J.G., Kleinow, T., and Wilkie, A.D., (2014) A yield-only model for the term structure of interest rates. *Annals of Actuarial Science*, 8: 99-130.  
DOI: 10.1017/S1748499513000146
22. Blake, D., Boardman, T., and Cairns, A., (2014) Sharing Longevity Risk: Why Governments Should Issue Longevity Bonds. *North American Actuarial Journal*, 18: 258-277.  
DOI: 10.1080/10920277.2014.883229
23. Cairns, A.J.G., Blake, D., Dowd, K., and Coughlan, G.D., (2014) Longevity Hedge Effectiveness: A Decomposition. *Quantitative Finance*, 14: 217-235.  
DOI:10.1080/14697688.2012.748986
24. Blake, D., Cairns, A.J.G., Coughlan, G., Dowd, K., and MacMinn, R. (2013) The New Life Market, *Journal of Risk and Insurance*, 80: 501-558.  
DOI: 10.1111/j.1539-6975.2012.01514.x  
Republished in French in *Revue d'économie financière*, 122: 129-164.
25. Cairns, A.J.G. (2013) Robust hedging of longevity risk. *Journal of Risk and Insurance*, 80: 621-648.  
DOI: 10.1111/j.1539-6975.2013.01525.x
26. Kleinow, T., and Cairns, A.J.G., (2013) Mortality and smoking prevalence: An empirical investigation in ten developed countries. *British Actuarial Journal*, 18: 452-466.  
DOI:10.1017/S1357321713000238
27. Cairns, A.J.G. (2011) Modelling and management of longevity risk: approximations to survivor functions and dynamic hedging. *Insurance: Mathematics and Economics*, 49: 438-453.  
DOI: 10.1016/j.insmatheco.2011.06.004
28. Cairns, A.J.G., Blake, D., Dowd, K., Coughlan, G.D., and Khalaf-Allah, M. (2011) Bayesian Stochastic Mortality Modelling for Two Populations. *ASTIN Bulletin*, 41: 29-59.  
DOI: 10.2143/AST.41.1.2084385
29. Cairns, A.J.G., Blake, D., Dowd, K., Coughlan, G.D., Epstein, D., and Khalaf-Allah, M. (2011) Mortality density forecasts: an analysis of six stochastic mortality models. *Insurance: Mathematics and Economics*, 48: 355-367.  
DOI: 10.1016/j.insmatheco.2010.12.005
30. Dowd, K., Blake, D., Cairns, A.J.G., Coughlan, G.D., and Khalaf-Allah, M. (2011a) A gravity model of mortality rates for two related populations. *North American Actuarial Journal*, 15: 334-356.
31. Coughlan, G.D., Khalaf-Allah, M., Ye, Y., Kumar, S., Cairns A.J.G., Blake, D., and Dowd, K. (2011) Longevity hedging: A framework for longevity basis risk analysis and hedge effectiveness. *North American Actuarial Journal*, 15: 150-176.
32. MacDonald, B.-J., and Cairns A.J.G. (2011) Three retirement decision models for defined contribution pension plan members: A simulation study. *Insurance: Mathematics and Economics*, 48: 1-18.  
DOI: 10.1016/j.insmatheco.2010.06.008
33. Dowd, K., Blake, D., and Cairns, A.J.G. (2011) A computationally efficient algorithm for estimating the distribution of future annuity values under interest-rate and longevity risks. *North American Actuarial Journal*, 15: 237-247.
34. Wilkie, A.D., Sahin, S., Cairns, A.J.G., and Kleinow, T. (2010) Yet more on a stochastic economic model: Part 1: Updating and refitting, 1995 to 2009. *Annals of Actuarial Science*, 5: 53-99.
35. Dowd, K., Cairns, A.J.G., Blake, D., Coughlan, G.D., Epstein, D., and Khalaf-Allah, M. (2010) Backtesting Stochastic Mortality Models: An Ex-Post Evaluation of Multi-Period-Ahead Density Forecasts. *North American Actuarial Journal*, 14: 281-298.

36. Dowd, K., Cairns, A.J.G., Blake, D., Coughlan, G.D., Epstein, D., and Khalaf-Allah, M. (2010) Evaluating the Goodness of Fit of Stochastic Mortality Models. *Insurance: Mathematics and Economics* 47: 255-265.
37. Dowd, K., Blake, D., and Cairns, A.J.G. (2010) Facing up to uncertain life expectancy: the longevity fan charts. *Demography* 47: 67-78.
38. Dawson, P., Dowd, K., Cairns, A.J.G., and Blake, D. (2010) Survivor Derivatives: A Consistent Pricing Framework. *Journal of Risk and Insurance*, 77: 579-596.  
DOI: 10.1111/j.1539-6975.2010.01356.x
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42. Cairns, A.J.G., Blake, D., Dowd, K., Coughlan, G.D., Epstein, D., Ong, A., and Belevich, I. (2009) A quantitative comparison of stochastic mortality models using data from England and Wales and the United States. *North American Actuarial Journal*, 13: 1-35.
43. Blake, D., Cairns, A., and Dowd, K. (2008) The birth of the life market. *Asia Pacific Journal of Risk and Insurance*, 3: 6-36. .  
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DOI: 10.1080/03461230802173608
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47. MacDonald, B.-J. and Cairns, A.J.G., (2007) The impact of DC pension systems on population dynamics. *North American Actuarial Journal* 11: 17-48.
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49. Byrne, A., Blake, D., Cairns, A.J.G., and Dowd, K. (2006) There's no time like the present: the cost of delaying retirement saving. *Financial Services Review* 15: 213-231.
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51. Blake, D., Cairns, A.J.G., Dowd, K., and MacMinn, R. (2006) Longevity bonds: financial engineering, valuation, and hedging. *Journal of Risk and Insurance*, 73: 647-672.  
DOI: 10.1111/j.1539-6975.2006.00193.x
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55. Cairns, A.J.G., Blake, D., and Dowd, K. (2006) Stochastic lifestyling: optimal dynamic asset allocation for defined contribution pension plans. *Journal of Economic Dynamics and Control*, 30: 843-877.
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61. Dowd, D., Blake, D., Cairns, A.J.G. (2004) Long-term Value-at-Risk. *Journal of Risk Finance*, 5(2):52-57
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