



THE
OPERATIONAL
RESEARCH
SOCIETY

Annual Report and Accounts

for the year ended 31 December 2019

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Foreword from the President

It is a great pleasure to introduce this report, which describes The Operational Research Society's achievements during 2019 under the vigorous leadership of John Hopes and sets out our plans for the future.

I strongly believe we're at a moment of huge potential for a step change in the visibility and influence of Operational Research, and for growth in our practice and research communities. To help make this happen I've set a particular focus on engaging more with government and policy-makers. There's a wide range of governmental, industrial and societal challenges that ought to play perfectly to OR's strengths, and the Society will adopt a key co-ordinating role. Steps towards this have already been taken in 2019, with plenty more to do in 2020.

This report describes some of The OR Society's key achievements during 2019 in responding to the opportunities and challenges presented by a fast-changing world. These have included: the launch of the Society's new website which provides a flexible platform for many of its initiatives; continued input into the Big Maths initiative (stemming from the Bond Review); the launch of our Women in OR and Analytics Network (WORAN), one of the key elements of our diversity and inclusion work; further progress on the development of the level 7 apprenticeship for an Operational Research Specialist; and work in agreeing how the community can benefit from the current focus on everything AI-related.

Growth for the Society has continued, with income up by 7% from that in 2018, driven by an excellent performance from our publications contract and the adoption of the ISMOR conference. However, expenditure for the year leapt up by 15%. Board understands the reasons for this and is targeting much better control for a surplus budget in 2020.

At the end of 2019 Board carried out a strategic review and have proposed a set of six strategic pillars which are broadly based on the existing priorities. The revised strategic direction – a minor tweak to the current heading rather than a complete change of course – will be discussed with General Council and built on during the year. Key developments will be: the opening of our museum-based OR exhibition; continue our work with Taylor & Francis to maximise the value of our current publications contract; to advance the society's diversity programme and ensure that we support the OR community in responding to challenges such as artificial intelligence. As always, there is much to do and I am sure there will be many challenges along the way; but we are in a better position than ever to achieve our strategic aims.

Since beginning the process of pulling together this annual report, the Society, along with the rest of the world, has been hit by the coronavirus pandemic. Much of our usual face-to-face activity of conferences, training courses and network meetings in 2020 has had to be cancelled or re-arranged. The Society's publications contract with Taylor & Francis has proved, once again, to be the financial key to smooth some of the turbulence. You'll see references to this throughout the report, and I'm pleased to confirm our auditors are happy with our going-concern status. The crisis will undoubtedly bring some significant changes to the Society's world in the next 12 months and beyond – it'll be both a challenging and interesting period.

Edmund Burke
OR Society President 2020-2021
May 2020

Introduction

The Operational Research Society is a charity set up to advance knowledge, interest and education in operational research (OR). Our vision is of a world improved by rigorous analysis and better, evidence-based decision-making: "OR providing world class analysis for world class decisions". In this world OR would be seen as indispensable – not just a 'nice to have' but a 'must have' – and be used and acknowledged widely in all areas of industry, business, government and the third sector.

As a charity, we must work for the public benefit, but we also aim to work for the good of our members, because without active, able and well-supported researchers and practitioners, students and supporters, OR would not exist. We disseminate learning; promote awareness of OR; support OR professionals and standards; and aim to ensure that UK OR has a 'voice at the table', both in the international OR world and in wider UK arenas. This represents a broad programme of activities and services, that has been growing year on year and that we continue to maintain and develop.

With the continuing dramatic changes in the world around us – such as rapid advances in data and technology and the growing importance of sustainability – our activities and services must adapt and expand accordingly, as these changes offer great opportunities for the OR discipline, OR professionals and The OR Society, as well as great challenges.

Review of the Year 2019

2019 was the fourth year of our 3 to 5-year strategic planning period, during which we are pursuing five main priorities on top of the 'Business as Usual' services and activities. These are: building the reach of the ORS, so that our products and services are accessed by a wider audience; building the visibility of OR, the holy grail of OR professionals for many years; strengthening the community, fostering activity and interaction amongst OR professionals; nurturing research; and building OR capacity ('the people pipeline').

Highlights of the Year

This has been another year of highlights which, along with our full range of activities, support our charitable aims to advance knowledge, interest and education in OR.

Advancing knowledge

A major highlight of the year, building on last year's Bond Review of knowledge exchange in the Mathematical Sciences, was the launch of the Big Mathematics initiative to implement the recommendations of that review. The OR Society is a member of the Council for the Mathematical Sciences which steers this initiative. We have also contributed members to the implementation committee which has been established. A possible outcome of the initiative would be the establishment of the Mathematical Sciences Academy, which could play a key role in the future advancement of knowledge in OR. Other activities to advance knowledge are covered below in the Events, Publications and Research sections.

Advancing interest

Our new website went live in 2019 thanks to the efforts of our project team, our external suppliers and many others who helped with content and testing. It supports the advancement of interest in OR by providing big improvements in communication with our members, publicity for our activities and brand awareness for OR itself.

A major initiative in 2019 was our Artificial Intelligence (AI) task and finish group, which delivered a strategy to support our members and the wider AI community as this important area develops further. We also co-sponsored the first Validate AI conference which highlighted some of the challenges in this rapidly evolving field. Such initiatives are key to advancing interest in OR as they keep the subject current and demonstrate its continuing relevance.

Our joint activity with other organisations helps advance interest in OR outside our own membership. For example, in 2019, the Institute of Chartered Accountants in England and Wales (ICAEW) selected the OR Society as its partner to help develop its own data analytics initiative, recognising our leadership in that field. In future our analytics network and analytics summit will be joint activities with the ICAEW which will introduce their members to the power and importance of OR.

Other activities to advance interest are covered below in the Events, OR in Education and Pro Bono OR sections.

Advancing education

Our apprenticeship trailblazer group, chaired by Alec Waterhouse of BEIS, received formal approval from the Institute for Apprenticeships for its proposal to develop the Standard for the Level 7 Apprenticeship in OR. It is planned to submit the Standard and End Point Assessment for final approval in April 2020. Other activities to advance education are covered below in the Education, Training and OR in Education sections.

Other highlights

Some of our 2019 highlights made contributions to all our charitable aims. These included the launch of our Women in OR and Analytics Network (WORAN) at the Royal Society in October. This network provides a key focus for addressing issues facing women in our profession.

In another highlight the society supported the successful bid by the Universities of Kent and Southampton for funding OR capacity building in a number of south east Asian countries. It is hoped that this will lead to the establishment of at least one OR Society among the countries involved.

Finally, we have agreed and rolled out a set of values that provide behavioural expectations to underpin our strategy. These are:

- Rigorous – rooted in evidence, rational analysis and strong historic principles
- Inclusive – vibrant community united by a common passion and purpose
- Proactive – leading improvements to services, processes, systems and outcomes
- Supportive – helpful, responsive and customer focussed

Achievements during the year

Conferences and Events

With Events and Conferences a key focus for both our membership and our target market for future members, we have delivered an extensive and varied programme of high quality events again in 2019. These events were an opportunity to further expand, enhance and enrich from a content perspective in traditional subject areas and also in new, rapidly developing and emerging technologies, such as Artificial Intelligence (AI). They also importantly provided an environment for members and non-members alike to engage, debate and further develop personal networks across business sectors and academia.

Our flagship event was once again the Annual Conference, which this year returned to The University of Kent and our thanks must be given to Co-Chairs Kathy Kotiadis and Said Salhi for all the hard work they and their committee put in to making it such a success. Three excellent keynote plenaries from Internationally acclaimed Erhan Erkut, Panos Pardalos and the IFORS President Gracia Speranza set up each day perfectly for the attendees to enjoy a rich programme of parallel streams, formal sessions and interactive workshops. The Making an Impact programme yet again provided a content-rich opportunity for everyone to share in best practices to maximise outcomes and successful implementation of projects and research. A wonderful social calendar, taking in the beauty of the Kent countryside and historic buildings, was rounded off with a seaside Gala Dinner and sunset. Thanks to all the speakers and contributors for making the Annual Conference such a rewarding experience for all attendees. We look forward to a similarly great event at OR62, at the University of Warwick in September 2020.

Other events have included:

The biennial NewToOR conference which focuses on those people with less than 10 years' experience of the study or practice of OR was held in April. A rich and rewarding programme of two days at Aston University was chaired by Laura Brudenell. Thanks to the organising committee, stream leads and in particular our plenary speakers, Frances Sneddon, Tony O' Connor, Paul Harper and Nira Chamberlain for providing another opportunity for the attendees to learn and share experiences at such an important stage of their career.

With the rapidly developing fields of robotics, machine learning and artificial intelligence gathering pace and providing interesting fields of study and practice for our members, the time was right for the OR Society to co-sponsor the ValidateAI Conference, alongside the ADA Lovelace Institute and the Data Science Institute at Imperial College. Held at the Royal Society in November the event was opened by Lord Willetts, who alongside Professor David Hand (Imperial College) explored the interrelated domains of statistics, data mining and data sciences, analytics and AI. The complexities and opportunities of combining analytical techniques with powerful computational processing across multiple business sectors mean this subject could become an annual event and a catalyst to promote AI validation. Thanks to OR Society member Shakeel Khan, HMRC, for his valuable contribution to the conception, creation and delivery of the event.

As mentioned earlier, the WORAN network was conceived, launched and successfully developed as a new and important platform for the development of our profession this year. Initially launched with a social gathering at the Annual Conference in Kent, the Network kicked off an ambitious programme of events at the Royal Society in October. Professor June Barrow-Green's address explored the many women, who throughout history, have driven forward mathematical sciences despite societal barriers, diversity issues and unconscious bias. Let's hope this has sparked off an interest in our membership where we can celebrate the achievement and impacts of female colleagues, the events are open to all members.

Earlier in the year, in June, the Annual Analytics Summit returned to the IET, Savoy Place in London, held in association with the Royal Statistical Society. Exploring a diverse agenda a healthy number of delegates and exhibitors enjoyed some great speakers including Philip Pilgerstorfer, Data Scientist at QuantumBlack looking at Making AI human again with Explainable AI (XAI). Payal Jain, MD of JCURV, Chair of DataUK and Women in Data focussed on extracting data from analytics and making it all about people. And Emma Kosh, focussed on Data Visualisation and how to communicate data better within organisations. There's so much still to explore in OR, data and analytics, and the Analytics Summit continues to chart the way forward for our members in this rapidly developing and converging field of expertise.

Our Special Interest Groups (SIG) and Regions continue to provide specialist / expert subject matter and local support and networking opportunities to our members. Holding regular meetings, academic and industrial

visits on a diverse range of subjects. The SIGs in particular increasingly engaged with the main Conference organising committees in helping coordinate stream activities.

Our AGM went on the road again this year hosted by Southern Region at Portsmouth University in July. Professor Sally Brailsford injected some serious content into the normally administrative proceedings with an exploration of Hybrid Simulation. Sally focussed on her recently published review of some 139 relevant papers, case studies of their application, along with detailed examples from the Healthcare Sector demonstrating the challenges and benefits of simulation methods in practice.

Our Annual Careers Open Day was held at Thinktank, Millenium Point in Birmingham late in November with exhibitors drawn from all sectors and students from across the UK. Thanks to all our recent graduate and NewToOR speakers who gave interesting and insightful presentations of their careers in OR....and to all the students for the great questions they asked.

The historical ISMOR / Defence SIG conference was held once again at Royal Holloway University in the summer. With greater support from the OR Society this year, the Board wish to thank the Organising Committee and the MoD for its ongoing support.

Partnerships with other organisations and professional institutes are increasingly important for the Society and provide opportunities to host new innovative events for a growing audience. A joint Computational Modelling event with BEIS and the Maths of OR conference with the IMA were two such examples held this year.

Rounding off the proceedings are the Annual Half Day events: The Beale and the Blackett lectures. Both events, always well attended, are appreciated both for the richness of thought-provoking content and for the opportunity for members and wider public to meet in a convivial environment to renew old friendships and make new ones. Prof Mike Jackson delivered the Beale Lecture in February on the subject of "the Future of OR is Present". As is customary this was alongside the PhD winner Dr Itamar Megiddo whose research focus is on Evidence Based Decision Making and Resource Allocation in Healthcare Policy. The Blackett Lecture was an interesting exploration of "high performing teams and high performing economies" with Prof Philip Bond who discussed whether lessons learned from Formula1 racing teams or winning Olympic Gold could be applied to building a better world. Both lectures, as is much of the content from many of our events, are available on the OR Society's YouTube channel.

Nothing from this huge programme of events would be possible without the dedication and efforts of the office staff, committee members and volunteers. We greatly appreciate the time they give and their ongoing support.

Publications

The OR Society has six academic journals. These are the *Journal of The Operational Research Society (JORS)*, *European Journal of Information Systems (EJIS)*, *Knowledge Management Research & Practice (KMRP)*, *Journal of Simulation (JOS)*, *Health Systems (HS)* and the *Journal of Business Analytics (JBA)*. During the year, there were some significant changes in editorship. Jonathan Crook and Tom Archibald completed their term as editors-in-chief of JORS and a new team of John Boylan, Martin Kunc, Said Salhi and George Zhang has taken over from the beginning of 2020. For EJIS, Dov Te'eni finished his term as part of the editorial team and has been replaced by Michael Myers. Sally Brailsford has now ended her membership of the editorial team for HS and Kathy Kotiadis has taken her place.

In 2019 we developed a new joint Strategic Plan with our publishers, Taylor & Francis, to promote our journals in line with the OR Society's aims and objectives. Encouraging progress has been made, particularly in the areas of abstracting and indexing, partnerships and social media.

JOS and JBA have now both been accepted on the Australian Business Deans Council (ABDC) Journal Quality List and HS was accepted for inclusion in PubMed Central. There were good Impact Factor increases for JORS, KMRP and JOS.

All members of the Association for Information Systems (AIS) can now gain access to recent content from EJIS, HS and JBA through our AIS eLibrary agreement. Under a similar arrangement, the Institute of Chartered Accountants in England and Wales (ICAEW) can now have access to JORS and JBA. All OR Society journals are now official partner journals on Publons, allowing better recognition for our reviewers. They are all also now available on the Researcher app which presents journal content alerts in a social media feed-style format.

A social media guide has been created for editors and we have been working to increase the level of engagement we have with our authors on Twitter.

We continue to monitor developments in the Open Access agenda, particularly proposals made under "Plan S", so that appropriate support is in place for articles to be made available via open access agreements.

The OR Society sponsored the attendance of editors at our annual conference (OR61) in Kent, where they met to discuss issues of common interest and were able to network with other participants.

Both of our non-academic publications: *Impact* magazine and *Inside OR* continue to flourish under the able editorship of Graham Rand and John Crocker, respectively. *Impact* magazine is published twice a year with up-to-date examples of OR being applied in practice and is designed to help meet our objective of extending the reach of OR to new sponsors and users. *Inside OR* is published monthly and keeps members informed about upcoming meetings and events, as well as providing interesting news items and other features.

Our thanks go to all the editorial teams, the staff in the OR Society office and Taylor & Francis for their work over the past year in supporting and promoting the OR Society publications, which continue to contribute significantly to the aims and objectives of the society.

Education

Over the last year, the Society's Education and Research Committee (ERC) has become simply the Education Committee (EC) as the Research Panel has grown and formally assumed its status as a Society committee (see below). This has enabled the EC to focus on its core remit.

Eve Hardy, our Education Officer, has continued the work of our OR in Education (ORiE) programme, renamed from OR in Schools (ORiS) so as to embrace both schools and universities. This move was a recognition of reality, as the ORiS taskforce was already overseeing the full scope of education outreach including universities. The new ORiE sub-brand and logo was launched last September with its own striking purple colour. Appreciative thanks go to Vicki Walker for leading the OriS Taskforce until recently and a warm welcome to Matthew Robinson, the new ORiE Taskforce chair.

Eve is now more a volunteer coordinator than a 'volunteer' to visit schools. This enables her to better help facilitate visits and talks, provide support with updated resources including videos, and help make all necessary arrangements. Eve is also representing the Society at meetings of the Joint Mathematical Council.

The major development in 2019 was the development of the Level 7 postgraduate Apprenticeship Standard in the occupation of “OR Specialist”. Apprenticeships at all levels, not just Level 7, enable employers to leverage their Apprenticeship Levy payments to provide employees with education and training. For the OR Society, an OR Apprenticeship at the postgraduate level is a strategic project to compensate for the drop in the number of UK-based graduates from UK MSc courses, many of which are composed mainly of international students. The MSc route into the OR profession used to account for over 75% of new UK entrants into the UK OR workforce, but nowadays accounts for under 10%.

In January 2019, a Trailblazer Group (TG) of OR employers was formed to develop an “occupational standard” for a postgraduate Level 7 Apprenticeship for an “OR Specialist”. The development and approval process is managed by the Institute for Apprenticeships and Technical Education (IfA). The Education Committee (EC) of the OR Society helped to set up the group, but it now functions independently of ORS, chaired by Alec Waterhouse of the Government OR Service. The EC liaises closely with Alec and the TG, and is briefing UK universities to be informed and prepared to become “providers” for the OR Level 7 Apprenticeship when its occupational standard and “End Point Assessment” (EPA) plan are approved for delivery by the IfA, probably in mid-2020.

Apprenticeships offer an excellent additional opportunity for universities to be “providers” of education in partnership with employers, but it does mean conforming more tightly to externally-imposed content specifications than many universities may have been used to and to keeping costs well within funding bands. We have identified a number of UK universities that are interested in being a provider for the apprenticeship and, particularly important for the submission, a subset to submit quotes as evidence to make a funding band recommendation. There is further work to find a potential end-point assessment organisation (EPAO).

Research

The Research Committee has had a successful year in increasing the Society’s input and influence among government, key funding councils, the Research Excellence Framework (REF), and facilitating in the development of new links with industry.

Committee members Arne Straus and Christine Currie were appointed to each of the two implementation teams of the government’s Big Mathematics Initiative. One of the team’s reports on a potential Mathematical Sciences Academy is now out for consultation, and there are several other initiatives under consideration, including a review of the funding landscape.

The Research Committee has worked closely with the OR’s key funding council, EPSRC and progress has been made in assisting the council with its definition and coding of OR. This will, in turn, improve the opportunities for the OR community to gain funding and initiate new areas for research. Arne Strauss has been appointed to the EPSRC Strategic Advisory Team (SAT) and we continue to represent the community on the ECR panel and Reviewer Panel. Several of the other funding Councils e.g. Innovate UK have presented and consulted with the Committee to facilitate the OR community’s influence with new emerging business innovation research and planning.

All three REF panels which have OR significance have been represented by a Committee member: Paul Harper (Mathematical Sciences), Emma Hart (Computer Science) and Tom Archibald (Business Management).

Work commenced to establish the Researcher People pipeline of PhD and Post Doc students for the 2019 academic year, and this will build on data gathered from the previous year.

Open funding opportunities, workshops, and research new stories are now regularly promoted on the ORS website. The ORS Researcher database, which was set up to increase collaboration amongst OR Society Researchers, is now attracting interest.

Training

During 2019, the society delivered 28 courses covering a range of OR topics, attracting a total of 235 delegates. The courses were well-received by participants with the average score being over 8.8 out of 10 for course content and teaching. The society has a slightly more extensive offering in its 2020 programme, continuing our long-term strategy to expand our training through improved targeting of suitable topics and making more use of a variety of training approaches.

OR in Education

In the academic year 2018-19 there was a total of 50 individual visits and events nationally. There were 13 individual visits to schools, 14 extra curricula visits (such as Big Bang fairs etc.) and 23 university visits. Other headline results include running one volunteer training session, presenting at two teacher conferences and exhibiting at The Big Bang Fair at the NEC, which had over 80,000 visitors.

Volunteer availability remains the main barrier to attending more events.

Teachers, volunteers, students and event organisers gave lots of positive feedback from ORiE events.

Teacher feedback:

Just wanted to say a big thank you for [the volunteer] being with us today. We had some really good feedback from the students that were involved. I was wondering if we could provisionally pencil the ORS - and [volunteer] in particular - in for around this time next year for the same workshop?

Volunteer feedback was similarly positive:

Organisation and set up - everything was well prepared before I arrived. Really good day - different from my day job. Tiring but enjoyable!

The students enjoyed it too:

It was fun and interactive, it showed how simulations work and help many jobs.

Event organiser feedback:

The OR Society stall at this year's GLF Science Fair Grand Final on Monday was amazing. The children loved the activities and your volunteers were excellent. Please pass on our huge thanks to them.

The OR in Schools sub-brand was changed to OR in Education in September 2019 to reflect the number of university and career fair visits carried out, and its associated colour scheme changed from blue to purple to emphasise the change.

Pro Bono OR

The Pro Bono OR scheme provides a showcase for OR and its benefits, opportunities for members to engage in exciting and novel work and the chance for our profession to make a positive difference to a wide variety of charities and their beneficiaries. Despite some periods of staff illness in 2019, 26 Pro Bono OR projects were started, and 15 projects were completed throughout the year. Volunteers used a variety of OR methods to help organisations tackle loneliness, reform food poverty in the North of England, build stronger community ties in disadvantaged areas, return girls to school in Nigeria, tackle the isolation of old age and promote social justice and human rights (to name just a few). Over 150 volunteer-days were supplied and feedback from charities and volunteers continues to be good.

In 2019, a volunteer details survey was issued to all pro bono volunteers to help the scheme understand the volunteer pool and thus manage and develop Pro Bono OR more effectively. The scheme also trialled its first

volunteer Christmas prize draw to show recognition to its dedicated volunteers and to encourage more of the volunteer mailing list to consider taking on a project.

Throughout 2019 Pro Bono OR continued to gain new contacts and worked well with familiar organisations, notably working with the other members of the Data4Good organising team (a conference Pro Bono helped organise in 2018) to create an online data maturity self-assessment tool. This tool is specifically for the not-for-profit sector and describes the stages non-profits go through on their journey towards data maturity. PBOR now include this in their resources for the third sector on the website pages. Pro Bono OR also collaborated with the Charities Aid Foundation to host a successful workshop focused on improving Third Sector organisations insight, decision making and ultimately service delivery.

To promote the scheme, Pro Bono OR was once again a part of the OR annual conference, providing a workshop for local Kent organisations to learn about the scheme itself and have an opportunity to talk with OR consultants regarding their organisation's issues. Additionally, adverts for the scheme were placed in several London CVS newsletters throughout the year, and a PBOR case study was featured in the Lancaster District CVS newsletter in July. Several presentations were also delivered to GORS, focusing on the scheme itself, the value of volunteering and an overview of a successful PBOR case study to illustrate both the types of projects available and the benefit to organisations.

Other items

A major project for the society during 2019 focussed on activity to boost membership. This was carried out with the support of external consultants under the leadership of our marketing team. Data was gathered via interviews, workshops and surveys to inform changes to our member proposition, branding and communications. Membership recruitment and retention campaigns will be following in 2020.

The society launched a care bursary scheme, initially as a pilot for the OR61 conference, to support attendance at our main events for those who might not otherwise be able to attend.

Members, Affiliates and Fellows

At the end of the year, The OR Society had 3,033 members. The Analytics Network boasted approximately 1,882 members, the society's LinkedIn group had 4,661 members and we had 4,559 Twitter followers. In addition, there were ten corporate partners – CORDA (part of BAe Systems), Royal Bank of Scotland, Ministry of Justice, Home Office, AWE, NATS, Office for National Statistics, Ministry of Defence, NHS Wales and ONS – representing 613 affiliates.

There were 340 accreditees, comprising 157 Fellows, 81 Associate Fellows, 49 Associates and 53 Candidate Associates. There are 19 members accredited as Chartered Scientists and one as a Registered Scientist.

Awards

- **Goodeve Medal** (awarded for best paper published in *JORS* in 2018): Awarded to Assimizele Brice, Robin Bye, Johannes Royset, and Johan Oppen "Preventing environmental disasters from grounding accidents: A case study of tugboat positioning along the Norwegian coast.", *Journal of The Operational Research Society* (2018) 69, 1773–1792.
- **Stafford Beer Medal** (awarded for best paper published in *EJIS* in 2018): Awarded to Neset Hikmet, Amy Connolly, Christopher Davis and Anol Bhattacharjee "User response to mandatory IT use: a coping theory perspective.", *European Journal of Information Systems*, 27 395-414.
- **Tocher Medal** (awarded for best paper published in *JoS* in 2017/2018): Awarded to Mauricio Cabrera-Rios, Dick E Arias Gonzalez, Esmeralda Niño-Pérez and Yaileen M. Méndez-Vázquez "A simulation-optimization strategy to deal simultaneously with tens of decision variables and multiple performance measures in manufacturing.", *Journal of Simulation*, 12 258-270.
- **Griffiths Medal** (awarded for best paper published in *Health Systems* in 2017/2018): Awarded to Victoria Mabin, Julie Yee, Sally Babington, Robyn Moore and Vanessa Caldwell "Using the Theory of Constraints to resolve long-standing resource and service issues in a large public hospital.", *Health Systems*, 7 230-249.
- **Lyn Thomas Impact Medal** (awarded annually for the academic OR research which best demonstrates both novelty and real-world impact): Awarded to Sonya Crowe, Christina Pagel and Martin Utley (University College London) "Improving services for children with congenital heart disease."
- **Doctoral Award** (awarded for the most distinguished body of research leading to the award of a doctorate in the field of OR in 2018): Awarded to Geraint Palmer, Cardiff University, "Modelling Deadlock in Queueing Systems".
- **President's Medal** (awarded for the best practical application of OR): Awarded to Martine Wauben, Phil Macdent, Ben Marshall and Adam Booker (Ministry of Justice) for "A Safety Diagnostic Tool for Harnessing Operational Data to Make Prisons Safer".
- **Beale Medal** (awarded for a sustained contribution to the theory, practice, or philosophy of OR): Awarded to Ailsa Land.
- **Companionship of OR** (awarded for sustained support and encouragement for the development of operational research or for those in influential positions who are in broad sympathy with the subject area): Awarded to Richard Eglese.

Structure of the Funds

The society's funds are unrestricted but are organised into:

- the General Fund, through which the ongoing operations of the society are conducted;
- the Reserve Fund, comprising the Seymour House property together with investments and cash on deposit to cover potential risks of a general nature, the most significant of which would arise if the society were forced to move quickly to a financial regime in which its publications income was significantly reduced; and
- the Designated Award Fund which represents a bequest received from Mrs May Hicks in 2002 and which is used for purposes consistent with her wishes, by providing awards for the best student OR projects undertaken for a client organisation.

Review of Operations

The society's income and expenditure account showed a deficit of £234k during the year, on a turnover of just under £1.5m. This compares with a deficit of £113k in 2018. This deficit was substantially worse than that planned in the budget, principally due to a number of significant budget omissions, lower delegate numbers at the main events and higher IT costs related to the launch of the new website and consolidating the IT infrastructure in the office. Financial management processes are being reviewed and tightened to prevent a repeat of this, and cost-saving means are being identified to build a surplus budget for 2020.

The publications income was almost £80k above the 2018 level, largely as a result of our publishing partners, Taylor & Francis, beginning to realise the full potential of our journal portfolio. It is anticipated that in 2020 publications income will improve further under the new contract.

The conference income, which was £36k above budget and £28k above the 2018 level, reflects the adoption of the ISMOR conference into our programme. However, this masks the disappointing financial performance of the New To OR conference, the analytics summit and particularly the annual conference. The annual conference, at least in delegate numbers, failed to reach the heights of the anniversary conference in Lancaster in 2018.

Board approved a significant budget (£30k) for a membership recruitment and retention project during the year. It is anticipated that this investment will be recouped as the predicted increase in membership is achieved.

Most operations to support the charitable aims of the society – such as conferences, special events, regional societies, special interest groups, education, publicity and outreach initiatives, the monthly Inside OR magazine and special charitable projects – result in deficits to the society. To support them the society relies primarily on subscriptions and income from its academic journals – particularly the latter which in 2019 contributed over £700k net of all associated costs. This serves as a reminder of the society's current financial dependence on the academic publication system; see the section on 'Risk' below. The society contributed more than ever to editorial support, providing financial assistance for its editors-in-chief to attend our annual conference, OR61.

The society employed 17.8 members of staff during 2019 (averaged over the year, 16.6 full-time-equivalents), compared to 18.6 (17.2 FTE) during 2018.

Assets, Reserves and Investments

The total net assets of the society decreased slightly to £2.404m over the year, with the deficit on income and expenditure being counter-balanced by an increase in investment values and a net £192k capital gain (realised and unrealised) on our investment funds. This reflects the strong recovery in stock markets during the year despite Brexit worries and global uncertainty of growth and trade wars.

It is important that the society maintains an appropriate level of reserves in relation to perceived financial risks. During the year the Board reviewed the society's reserves policy. In setting its reserve policy, the Board distinguished between the funds held in the General Fund, which arise from the normal operating activities of the society, and the Reserve Fund held to ensure that the society can continue long-term operations in the event of financial risks materialising. The policy review considered the minimum and maximum levels for the amount required in the Reserve Fund. It was agreed that this steadier approach to reserves, based on the costs of the society rather than the (publications) income, remained valid.

Based on the annual costs of running the society, one year's costs of £930k should be a minimum value for the reserves and the maximum value would then be two years' costs giving a value of £1.8 million. This would cover any growth of the society over the next few years and release funds to further the society's aims.

At 31 December 2019, the society's reserves – its investments and cash held within the Reserve Fund – amounted to £1.76m. The reserves are therefore within their prescribed limits. The Board will bear this in mind when considering opportunities for spending on worthwhile one-off projects that further the society's objectives.

The society's investments and their performance are kept under review by the Investment Committee in accordance with policies decided by the Board. The Committee is chaired by the Treasurer and, in addition to other members of the society, includes representatives from the society's investment managers.

Risk

The society's dependency on journal income is the most significant material risk. Our new contract with Taylor & Francis to a large extent mitigates this risk for the society, for the five years of the contract (finishing in December 2022), by transferring much of it to the publisher. The risk has not disappeared though, and we could never be wholly insulated from any impact that might result from this risk on our publisher. In addition, beyond the contract period our exposure to the risk is unchanged and the risk may in fact have increased following moves to ensure that EU-funded research is, in future, made available via the open-access business model.

A key strategic risk is that OR could be seen as less relevant in the rapidly changing environment, as big data and increasing computing power drive technical developments and as new discipline descriptions compete for attention and funding. We have been mitigating this through a number of initiatives led by our Analytics Development Group and are also actively promoting the relevance of OR to data science, robotics and artificial intelligence as well as other overlapping fields. More generally, we aim to raise the visibility of OR and support outward-looking practice and membership through outreach to other professional societies and to organisations and businesses who may benefit from what OR has to bring and through the variety of topics and speakers at our events.

A further key risk is that The OR Society could be seen as less relevant to OR professionals. We have been mitigating this through the whole range of activities addressing our strategic goals and described elsewhere in this report.

The Board regularly reviews the risk register covering a wide range of operational risks, including IT risks, and, where feasible, puts mitigating action in place.

Brexit Position

The impact of the exit from the EU by the UK remains under consideration. Whilst the trustees expect the likely direct impact on the society to be low, the greatest threat would be that of a UK recession brought on by a disorderly exit. This could impact all sources of income as might happen during any period of economic downturn. The terms of its current publications contract gives it considerable protection from such risks. It faces no threat in terms of the origin of its employees.

The threats to the community could be more widespread, from the number of EU citizens working in the field through to access to funding and collaboration on EU research projects.

COVID-19 Position

The COVID-19 pandemic has had an impact on businesses across the world, and in this respect the Society is no different. At the time of writing, the Society has had to cancel its face-to-face meetings, networking events, training courses and conferences. Options for re-scheduling the larger events are under consideration, as are online alternatives to fill the void. The Society updated its IT infrastructure during 2019 and this has enabled its staff to all switch to homeworking without disruption. Budgets and cashflow forecasts for 2020 have been revised to account for the loss of income from events, and whilst this changes a planned surplus budget into a deficit situation, the overall cashflow situation remains healthy. In this case, the Society's publishing contract provides protection from such disruption. The Society does not foresee the need to lay off or furlough any of its staff during 2020.

Our investment portfolio value has fallen by more than 20% as a result of the crisis but fortunately the Society is able to take a long-term position during which the investments can recover their value.

In the longer term, the biggest threat will be the impact of the subsequent worldwide economic difficulties.

In summary, the Society's accounting status as a 'going concern' is not changed.

Key Management Personnel

The Key Management Personnel for the society comprise the trustees (its Board of Directors) and the Executive Director. No remuneration is payable to trustees for service on the Board.

Basis for Remuneration

The President, Treasurer and President Elect or Immediate Past President review the Executive Director's salary and, when agreed by Finance Committee, a written recommendation is made to Board. The Executive Director leads the process for other staff which is again initially discussed by Finance Committee before the recommendations go to Board for final approval.

Voluntary Contributions

The Society's work in 2019 benefited from voluntary contributions of time, from members and others, through these principal lines of work: refereeing of journal papers; editing of journals; conference organisation; authorship and delivery of talks to regional societies and special interest groups; organisation of regional societies and special interest groups; the work of the society's officers; contributions to the administration of the society, its Awards and its accreditations through service on Board and the society's committees.

In addition to this, more than two hundred members have volunteered, or offered to volunteer, with our two main outreach projects, OR in Schools and Pro Bono OR. Their work benefits the OR community, the future development of the profession and the wider society and is a fine contribution to The OR Society's charitable objectives.

It is estimated that a total of 5,000 person-days were contributed in 2019. If this time is valued at £500 per day, its value is £2.5M. The society is most grateful to all who contributed voluntary effort, without which the society could not accomplish its goals.

Objectives for 2020

Following a strategic review workshop held in late 2019, Board produced a revised version of its 3-5 year goals and priorities. These build on those in place for the previous strategic planning phase and represent exciting opportunities for the Society and the wider OR community. The revised strategic pillars are to: raise awareness of the **importance of OR**; support **OR knowledge development**; support **OR education**; grow **membership and wider reach**; ensure **financial sustainability** of the Society; and address **diversity and inclusion challenges** in OR and the OR Society.

Work has already started on many of the initiatives that we hope will come to fruition in the next year or so:

- working with Taylor & Francis to capitalise on its strategy to maximise the value of our current publications contract, develop robust publishing models to deal with opportunities and challenges presented by open access publishing and Plan S;
- ensuring that OR is fully involved in the Big Mathematics Initiative (following up the recommendations of the Bond review of knowledge exchange in the mathematical sciences);
- building policy influence with key Government contacts and connect with other key decision makers;
- implementing an engagement plan for the analytics / artificial Intelligence /data science community, and specifically implementing the recommendations of the artificial intelligence task-and-finish group;
- supporting the full establishment and growth of the Women in OR and Early Careers networks;
- maximising benefit from the new website, social media campaigns and other marketing activity to raise the brand profile of OR itself;
- launching a museum-based travelling exhibition to raise public awareness of OR;
- launch the level 7 OR apprenticeship scheme for OR Specialist;
- strengthening relationship with key bodies such UKRI, Royal Society, Science Council and other learned societies;
- investigating diversification of income, including exploring new streams (accrediting University courses, fundraising / donations, sponsorship);
- finalising and implementing our diversity plan based on recommendations from the diversity champion;
- creating and disseminate thought leadership pieces (with the initial focus on ethics);
- demonstrating relevance of OR to complex problems and big issues.

These developments will be on top of our existing broad sweep of services: conferences, events, lectures and training; publications; Pro Bono OR and OR in Schools; representing The OR Society on bodies including The Council for Mathematical Sciences, the Science Council, EURO and IFORS; and our more inward-looking activities to improve sustainability, efficiency and effectiveness.

For a relatively small professional body in an uncertain world, there are many challenges to overcome. By undertaking these activities, we aim not just to meet the challenges, but to grow the profession and The OR Society's contribution and make the most of the opportunities awaiting us.

Information about the society

- (1) The Operational Research Society is a company limited by guarantee (no. 663819). It is also a charity registered in accordance with the provisions of the Charities Act 2011 (registration no. 313713)
- (2) The objects of the society are given in its Memorandum and Articles and can be summarised as:
 - (a) the advancement of knowledge by fostering, promoting and furthering interest in operational research; and
 - (b) the advancement of education by providing facilities for and, by subsidising it, endowing, organising or supporting scholarships or educational or training schemes; and conducting examinations or advising on their content.
- (3) The society is empowered to do all proper things in pursuit of these objectives.
- (4) The affairs of the society were managed during 2019 by the elected officers and members of the Board listed below. Together they constitute the Board of Directors of the limited company and Trustees of the charity and the members of its management committee. Specific matters are delegated to particular committees of the society by resolution of the Board and in accordance with the society's Articles.

The following served as members of the Board in 2019

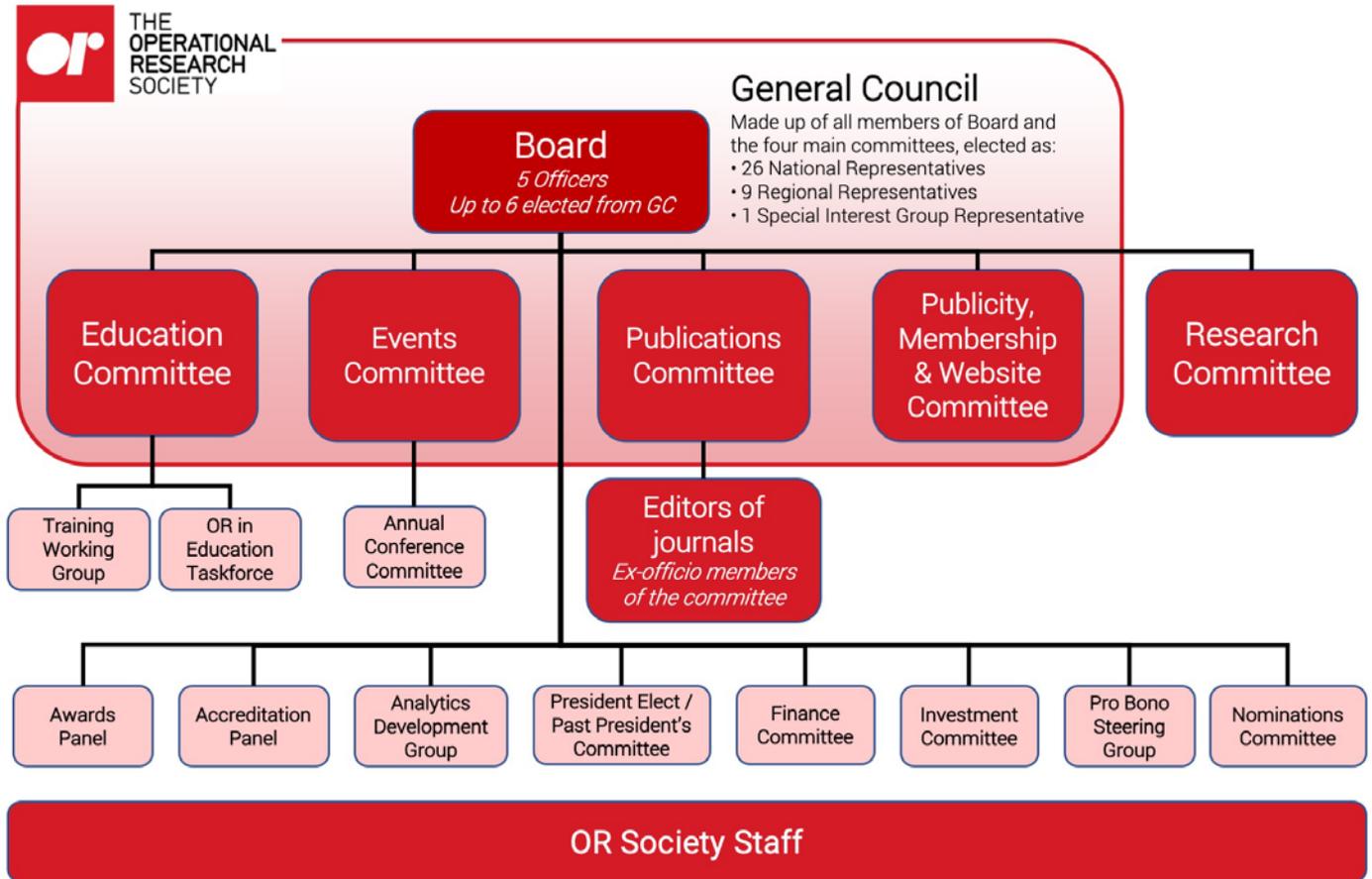
J R HOPES President	P ALBORES	R A SCOTT
E K BURKE President Elect	J BATSON	
S HOWICK Vice President	A R CLARK	
A P ROBINSON Vice President	R W EGGLESE	
J E WILLIAMS Hon. Treasurer	N MORRILL *	

Unless otherwise stated, changes in the membership of the Board occur at the end of a calendar year.

* N Morrill was appointed to fill a casual vacancy on 28 August 2019.

The Board is supported by a General Council with a maximum membership of thirty-six. These two bodies assist the society in its ongoing commitment to involve as many members as possible in its affairs. The Board of Directors is responsible for governance and strategy and the General Council, with its wide representation, provides advice, feedback and challenge and monitors the Board's activity. Members of General Council have also, in all cases, been assigned to one of the society's four main committees: Publications; Publicity, Membership and Website; Education and Research; and Events and the Chairs of those committees are currently Board members.

The structure is set out in the diagram below.



(5) The committees are established to implement policies of Board & General Council with respect to meeting the society's objectives and to controlling expenditure. The names of the committees are set out as follows, together with the object ((a) or (b) as above) towards the achievement of which they contribute:

Accreditation Panel	(a)
Analytics Development Group	(a)
Awards Panel	(a)
Education	(b)
Events	(a), (b)
Finance	Management of financial aspects
Investment	Management of investments
Nominations	Volunteer recruitment to governance roles
Past President's/President Elect's	Elections, planning & administrative reviews
Pro Bono Steering Group	(a)
Publications	(a)
Publicity, Membership & Website	(a)
Research	(a)
Training Working Group	(b)

(6) Other Committees are set up from time to time for specific purposes, but they are given no delegated powers. In addition, the society has a large number of active Special Interest Groups which are listed in the Journal of the society. They contribute particularly to object (a).

(7) The registered address of the society is:

Seymour House
12 Edward Street
BIRMINGHAM
B1 2RX

Its Executive Director is:

I G Blackett
The OR Society
12 Edward Street
BIRMINGHAM
B1 2RX

Its Bankers are:

The Co-operative Bank
Delf House
Southway
SKELMERSDALE
WN8 6WT

Its Solicitors are:

Sydney Mitchell and Co
Cavendish House
Waterloo Street
BIRMINGHAM
B2 5PU

Its Auditors are:

Mazars LLP
45 Church Street
BIRMINGHAM
B3 2RT

Its Investment Adviser is:

Tom Quicke
Investec
30 Gresham Street
LONDON
EC2V 7QN

Its Stockbrokers are:

Investec
30 Gresham Street
LONDON
EC2V 7QN

(8) The society's investment policy is governed by the legislative provisions relating to charity investments, but the society is not otherwise restricted in the way in which it can invest. However, it is the society's policy not to invest in tobacco shares.

(9) These particulars are published in compliance with Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) (effective 1 January 2019).

Public Benefit

The OR Society is a charity and meets the public benefit test as set out in the Charities Act 2011 in various ways:

Advancement of education:

Through the OR in Schools initiative, its many networking, training and conferencing activities in schools, universities and workplaces and extensive on-line resources, The OR Society promotes the understanding of OR and how it can be applied for the wider benefit. The OR Society is a participating society (with voting rights) on the Joint Mathematical Council of the UK.

Advancement of science:

Through its publications, conferences and networking activities; representation on the Council for Mathematical Sciences, Science Council, funding bodies and international federations; and on-line materials and facilities, The OR Society supports, promotes and publicises research; raises standards of research and practice; and promotes the effective application of OR for wider social benefit. Through its accreditation and awards schemes, The OR Society recognises and promotes engagement, effectiveness and development in its members, further raising standards.

Advancement of community development:

The OR Society encourages volunteering and involvement through its Pro Bono OR initiative, involvement of members in outreach to schools and universities and networks of Regional and Special Interest Groups.

The OR Society funds educational, development and research projects that are in line with its charitable aims of advancing knowledge and education through fostering OR

All OR Society events and training are open to all who may be interested. In addition, it minimises barriers to access by:

- (1) ensuring that many of its on-line resources are publicly and freely available;
- (2) keeping membership fees low and offering reduced fees for unwaged groups; and
- (3) supporting Regional and Special Interest Group networks which offer free meetings.

In governing The OR Society, the Trustees have had regard to the Charity Commission's public benefit guidance.

Statements as to disclosure of information to auditors

In accordance with Company Law, as the charity's trustees, we certify that:

- so far as we are aware, there is no relevant audit information of which the Charity's Auditor is unaware; and
- we have taken all the steps that we ought to have taken in order to make ourselves aware of any relevant audit information and to establish that the Charity's Auditor is aware of that information.

Statement of responsibilities of the elected officers and members of the Board

Company law requires the elected officers and members of the Board to prepare financial statements for each year which give a true and fair view of the state of affairs of the society and of the surplus or deficit of the society for that period. In preparing those financial statements, the elected officers and members of the Board are required to:

- select suitable accounting policies and then apply them consistently;
- make judgements and estimates that are reasonable and prudent;
- state whether applicable accounting standards have been followed, subject to any material departures disclosed and explained in the financial statements;
- prepare the financial statements on the going concern basis unless it is inappropriate to assume that the society will continue in business.

The elected officers and members of the Board are responsible for keeping proper accounting records which disclose with reasonable accuracy at any time the financial position of the society and to enable them to ensure that the financial statements comply with the Companies Act 2006. They are also responsible for safeguarding the assets of the society and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

Appointment of trustees

The officers and other members of the Board are elected by secret ballot of the society's membership and the members of General Council respectively, to serve for a three-year term (except for the President, who serves one year as President-Elect, two years as President and a further year as Immediate Past-President). A member of the Board, other than the President, whose first term of office has expired may stand for election for one further term. At the end of 2019, one member of the Board completed their term of office: P ALBORES

Induction of new trustees

New trustees receive a comprehensive information pack, setting out details of their role and responsibilities as both trustees and company directors, the nature of a charity, the society's constitution, its policies on members' interests and expense claims and including the Charity Commission's 'welcome' leaflet.

Members' interests

In accordance with Article 46 of its constitution, the society requires that members of Board or committees having an interest in a matter to be debated should declare that interest and leave the room whilst the matter is discussed and decided. Members of the Training Working Group are drawn from organisations which have no interest in bidding for courses and wherever appropriate, recommendations on major charitable projects are made by a special expert committee comprised entirely of disinterested parties.

Approval of report

We approve this report and the audited accounts for the year 1 January to 31 December 2019 and recommend their adoption by the society at its Annual General Meeting.

E K BURKE President

J E WILLIAMS Hon Treasurer

J BATSON

A R CLARK

R W EGGLESE

J R HOPES

S HOWICK

J MEDHURST

N MORRILL

A P ROBINSON

R A SCOTT

Being the elected officers and members of the Board of The Operational Research Society as at 20 May 2020.

I G Blackett

Executive Director

20 May 2020

Accounts

for the year ended 31 December 2019

INDEPENDENT AUDITOR'S REPORT TO THE MEMBERS OF OPERATIONAL RESEARCH SOCIETY

We have audited the financial statements of Operational Research Society (the 'charity') for the year ended 31 December 2019 which comprise the Statement of Financial Activities, Balance Sheet, Statement of Cash Flows and notes to the financial statements, including a summary of significant accounting policies. The financial reporting framework that has been applied in their preparation is applicable law and United Kingdom Accounting Standards, including FRS 102 "The Financial Reporting Standard applicable in the UK and Republic of Ireland" (United Kingdom Generally Accepted Accounting Practice).

In our opinion, the financial statements:

- give a true and fair view of the state of the charity's affairs as at 31 December 2019 and of its income and expenditure for the year then ended;
- have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice; and
- have been prepared in accordance with the requirements of the Companies Act 2006.

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing (UK) (ISAs (UK)) and applicable law. Our responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the financial statements section of our report. We are independent of the charity in accordance with the ethical requirements that are relevant to our audit of the financial statements in the UK, including the FRC's Ethical Standard and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Emphasis of matter – Impact of the outbreak of COVID-19 on the financial statements

In forming our opinion on the company financial statements, which is not modified, we draw your attention to the directors' view on the impact of the COVID-19 as disclosed on page 14, and the consideration in the going concern basis of preparation on page 29 and non-adjusting post balance sheet events on page 38. Since the balance sheet date there has been a global pandemic from the outbreak of COVID-19, the potential impact of COVID-19 became significant in March 2020 and is causing widespread disruption to normal patterns of business activity across the world, including the UK.

The full impact following the recent emergence of the COVID-19 is still unknown. It is therefore not currently possible to evaluate all the potential implications to the company's trade, members, suppliers and the wider economy.

Conclusions relating to going concern

We have nothing to report in respect of the following matters in relation to which the ISAs (UK) require us to report to you where:

- the trustees' use of the going concern basis of accounting in the preparation of the financial statements is not appropriate; or
- the trustees have not disclosed in the financial statements any identified material uncertainties that may cast significant doubt about the charity's ability to continue to adopt the going concern basis of accounting for a period of at least twelve months from the date when the financial statements are authorised for issue.

Other information

The trustees are responsible for the other information. The other information comprises the information included in the annual report, other than the financial statements and our auditor's report thereon. Our opinion on the financial statements does not cover the other information and, except to the extent otherwise explicitly stated in our report, we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated. If we identify such material inconsistencies or apparent material misstatements, we are required to determine whether there is a material misstatement in the financial statements or a material misstatement of the other information. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact.

We have nothing to report in this regard.

Opinions on other matters prescribed by the Companies Act 2006

In our opinion, based on the work undertaken in the course of the audit:

- the information given in the Trustees' Report which includes the Directors' Report prepared for the purposes of company law, for the financial year for which the financial statements are prepared is consistent with the financial statements; and
- the Directors' Report included within the Trustees' Report has been prepared in accordance with applicable legal requirements.

Matters on which we are required to report by exception

In light of the knowledge and understanding of the charity and its environment obtained in the course of the audit, we have not identified material misstatements in the Directors' Report included within the Trustees' Report.

We have nothing to report in respect of the following matters in relation to which the Companies Act 2006 requires us to report to you if, in our opinion:

- adequate and proper accounting records have not been kept, or returns adequate for our audit have not been received from branches not visited by us; or
- the financial statements are not in agreement with the accounting records and returns; or
- certain disclosures of trustees' remuneration specific by law are not made; or
- we have not received all the information and explanations we require for our audit; or
- the trustees were not entitled to prepare the financial statements in accordance with the small companies regime and take advantage of the small companies' exemption in preparing the Trustees' Report and from the requirement to prepare a Strategic Report.

Responsibilities of Trustees

As explained more fully in the trustees' responsibilities statement set out on page 21, the trustees (who are also the directors of the charitable company for the purposes of company law) are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view, and for such internal control as the trustees determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the trustees are responsible for assessing the charity's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the trustees either intend to liquidate the charity or to cease operations,

or have no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists.

Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

A further description of our responsibilities for the audit of the financial statements is located on the Financial Reporting Council's website at www.frc.org.uk/auditorsresponsibilities. This description forms part of our auditor's report.

Use of the audit report

This report is made solely to the company's members as a body in accordance with Chapter 3 of Part 16 of the Companies Act 2006. Our audit work has been undertaken so that we might state to the company's members those matters we are required to state to them in an auditor's report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the company and the company's members as a body for our audit work, for this report, or for the opinions we have formed.

Ian Holder
(Senior Statutory Auditor)
for and on behalf of Mazars LLP
Chartered Accountants and Statutory Auditor
45 Church Street
Birmingham
B3 2RT

OPERATIONAL RESEARCH SOCIETY

STATEMENT OF FINANCIAL ACTIVITIES FOR THE YEAR ENDED 31 DECEMBER 2019

		-----Unrestricted Funds-----			2019	2018
		General	Reserve	Designated	£	£
	Note	Fund	Fund	Award	Total	Total
		£	£	Fund	Funds	Funds
				£	£	
INCOME FROM :						
Charitable activities :						
Subscriptions		146,995	-	-	146,995	142,127
Events and Conferences		283,219	-	-	283,219	255,477
Training		115,140	-	-	115,140	114,755
Publications	3	939,057	-	-	939,057	860,350
Accreditation		8,710	-	-	8,710	7,516
Websites / Digital Services		1,580	-	-	1,580	6,560
		1,494,701	-	-	1,494,701	1,386,785
Investment Income	7	0	52,941	1,962	54,903	50,896
Total Income		1,494,701	52,941	1,962	1,549,604	1,437,681
EXPENDITURE ON :						
Raising Funds						
Investment Management Costs		-	12,192	-	12,192	11,645
Direct charitable expenditure :						
Subscriptions		149,037	691	-	149,728	106,689
Events and Conferences		381,506	673	-	382,179	351,025
Training		101,848	220	-	102,068	100,883
Publications	3	345,785	904	-	346,689	255,350
Accreditation		7,746	28	-	7,774	4,370
Websites / Digital Services		194,555	1,207	-	195,762	181,794
Other Charitable Expenditure	4	419,082	1,880	1,500	422,462	356,297
Governance and Support Costs	5	128,953	3,033	-	131,986	153,578
		1,728,512	8,636	1,500	1,738,648	1,509,986
Total Expenditure	6	1,728,512	20,828	1,500	1,750,840	1,521,631
Net gains/(losses) on Investments	18	-	187,899	4,199	192,098	(107,744)
NET INCOME/(EXPENDITURE) and NET MOVEMENT IN FUNDS FOR THE YEAR						
		(233,811)	220,012	4,661	(9,138)	(191,694)
Reconciliation of funds :						
Total funds brought forward		669,540	1,689,385	54,234	2,413,159	2,604,854
Total funds carried forward		435,729	1,909,397	58,895	2,404,021	2,413,159

The notes on pages 29 to 37 form part of these accounts.

The statement of financial activities includes all gains and losses recognised in the year. All income and expenditure derive from continuing activities.

OPERATIONAL RESEARCH SOCIETY
 (A company limited by guarantee. No. 663819)

BALANCE SHEET - 31 DECEMBER 2019

	<u>Note</u>	<u>2019</u> £	<u>2018</u> £
FIXED ASSETS			
Fixed Assets : Tangible	8	217,181	220,829
Intangible	8	138,405	172,586
Investments :			
Listed at Market Value	9	1,732,828	1,480,746
Cash Deposited with Investment Brokers		29,047	54,510
Charities Aid Foundation	10	73,600	67,439
		<u>2,191,061</u>	<u>1,996,110</u>
CURRENT ASSETS			
Debtors	11	261,440	1,118,266
Cash at Bank and In Hand		149,178	406,664
		<u>410,618</u>	<u>1,524,930</u>
CREDITORS (amounts falling due within one year)	12	197,658	1,107,881
NET CURRENT ASSETS		<u>212,960</u>	<u>417,049</u>
TOTAL ASSETS LESS CURRENT LIABILITIES		<u>2,404,021</u>	<u>2,413,159</u>
FUNDS			
General Fund		435,729	669,540
Reserve Fund	15(1)	1,909,397	1,689,385
Designated Award Fund	15(2)	58,895	54,234
TOTAL FUNDS		<u>2,404,021</u>	<u>2,413,159</u>

 These financial statements have been prepared in accordance with the special provisions relating to companies subject to the small companies regime within Part 15 of the Companies Act 2006.

J. E. WILLIAMS
 Honorary Treasurer

E. K. BURKE
 President

The notes on pages 29 to 37 form part of these accounts.

OPERATIONAL RESEARCH SOCIETY

STATEMENT OF CASH FLOWS FOR THE YEAR ENDED 31 DECEMBER 2019

	<u>2019</u> £	<u>2018</u> £
Reconciliation of net incoming resources to net cashflow from operating activities :		
Net Movement in Funds	(9,138)	(191,695)
Depreciation Charge - Tangible Assets	24,366	18,547
Depreciation Charge - Intangible Assets	51,717	10,320
Loss on Disposal of Fixed Assets	0	0
Decrease/(Increase) in Debtors	856,826	(431,597)
Increase/(Decrease) in Creditors	(910,223)	943,707
(Gains)/Losses on Investments	(192,098)	107,744
Investment Income	(54,903)	(50,896)
Cash Flows from Operating Activities	<u>(233,453)</u>	<u>406,130</u>
Investment Income	52,941	49,080
Purchase of Tangible Assets	(20,718)	(46,727)
Purchase of Intangible Assets	(17,536)	(74,897)
Purchase of Investments	(172,771)	(201,701)
Proceeds on Disposal of Investments	108,588	172,022
Cash Flows from Investing Activities	<u>(49,496)</u>	<u>(102,223)</u>
Increase/(Decrease) in Cash and Cash Equivalents in the Year	(282,949)	303,907
Cash and Cash Equivalents at the Beginning of the Year	461,174	157,267
Cash and Cash Equivalents at the End of the Year	<u><u>178,225</u></u>	<u><u>461,174</u></u>

1 ACCOUNTING POLICIES

(1) Basis of preparation

The accounts have been prepared in accordance with the Companies Act 2006, the Charities Act 2011, the Charities Statement of Recommended Practice (FRS 102), the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) and under the historical cost convention in accordance with applicable Accounting Standards as modified by the accounting policy for investments quoted on a recognised stock exchange, which are stated at market value (see 1(8) below).

The Operational Research Society meets the definition of a public benefit society under FRS 102.

(2) Preparation of the accounts on a going concern basis

The Operational Research Society operates as a going concern and the trustees are of the view that it will continue to do so for the foreseeable future.

(3) Key estimates and judgements

When preparing the financial statements, management makes a number of judgements, estimates and assumptions about the recognition and measurement of assets, liabilities, income and expenses. The estimate that has the most significant effect relates to intangible fixed assets. The company amortises fixed assets over their estimated useful lives. The estimation of the useful lives of assets is based on historic performance as well as expectations about future use and therefore requires estimates and assumptions to be applied by management. The actual lives of these assets can vary depending on a number of factors, including the maintenance and level of upkeep of the software systems.

(4) Designation of funds

Income and expenditure arising from the normal charitable activities of the Society is included within the General Fund.

The Reserve Fund consists of resources of the Society which are represented by land and buildings, fixed asset investments and cash deposited with the Society's investment brokers.

The Designated Award Fund represents a legacy received in 2002 which will be used to fund an annual award.

The Society operates a reserves policy that reflects its critical dependence on journal income.

The policy sets the minimum level of reserves at one year's fixed running costs of £929k to keep the charity viable whilst alternative funding is found.

The maximum level is to be set at 2 years running costs or £1.85 million

(5) Dividends and investment income

Dividends and investment income are recognised when receivable.

(6) Other income and expenditure

Income and expenditure other than dividends are accounted for on an accruals basis.

(7) Value added tax

The Society has partial exemption status for Value Added Tax and Value Added Tax on apportionable costs which cannot be reclaimed is disclosed separately within administration costs. This item was £Nil in 2019 (2018 - £Nil).

(8) Investments

Investments quoted on a recognised stock exchange are included in the accounts at their market value.

OPERATIONAL RESEARCH SOCIETY

NOTES TO THE ACCOUNTS FOR THE YEAR ENDED 31 DECEMBER 2019

1 ACCOUNTING POLICIES (continued)

(9) Tangible and Intangible fixed assets

Tangible and intangible fixed assets costing more than £1,000 and with a useful economic life in excess of 3 years are capitalised and included at cost including any incidental expenses of acquisition.

Depreciation of tangible fixed assets is charged on a straight line basis at the following rates :

Long leasehold building	-	2%
Office machines and computer equipment	-	25%
Fixtures and fittings	-	10%

Amortisation of Intangible fixed assets is charged on a straight line basis at the following rate :

Software systems	-	25%
------------------	---	-----

The amortisation rate charged is based on management's best estimate of the useful life of the software systems.

(10) Debtors

Trade and other debtors are recognised at the settlement amount due after any trade discount offered. Prepayments are valued at the amount prepaid net of any trade discounts due.

(11) Cash at bank and in hand

Cash at bank and cash in hand includes cash and short term highly liquid investments.

(12) Creditors and provisions

Creditors and provisions are recognised where the charity has a present obligation resulting from a past event that will result in the transfer of funds to a third party and the amount due to settle the obligation can be measured or estimated reliably. Creditors and provisions are normally recognised at their settlement amount after allowing for any trade discounts due.

(13) Pensions

The Society contributes to individual pension schemes established for each eligible employee.

(14) Allocation of costs

Salaries, depreciation, websites / digital services expenditure and other central and establishment overheads are allocated to appropriate cost categories using consistently applied ratios based on estimates of actual time and costs expended in each area.

(15) Financial instruments

The Society only has financial assets and financial liabilities of a kind that qualify as basic financial instruments. Basic financial instruments are initially recognised at transaction value and subsequently measured at their settlement value.

2 LEGAL STATUS OF THE SOCIETY

The Society is a company limited by guarantee, has no share capital and is a registered charity. The objectives of the Society are the advancement of knowledge and education in operational research.

The liability of each member in the event of a winding-up is limited to £1.

OPERATIONAL RESEARCH SOCIETY

NOTES TO THE ACCOUNTS FOR THE YEAR ENDED 31 DECEMBER 2019 (continued)

3 PUBLICATIONS	<u>2019</u>	<u>2018</u>
	£	£
Incoming resources :		
Journal / KMRP / JOS	707,487	643,724
Inside OR	2,822	3,738
EJIS / Health Systems	225,688	208,567
Other Publications	<u>3,060</u>	<u>4,321</u>
	<u>939,057</u>	<u>860,350</u>
Resources used :		
Journal / KMRP / JOS	146,495	72,495
Inside OR	110,802	106,225
EJIS / Health Systems	72,722	72,542
Impact Magazine	11,680	10,169
Other Publications	<u>4,990</u>	<u>633</u>
	<u>346,689</u>	<u>262,064</u>
4 OTHER DIRECT CHARITABLE EXPENDITURE		
Non-revenue earning activities in pursuit of charitable aims		
IAOR Online - Members access	10,115	9,624
Library	0	0
Foreign Affairs Expenses	11,841	7,504
Regional Societies	10,370	9,608
Special Interest Groups	16,661	15,325
Public Information about OR :		
Science of Better	16,824	16,307
Learn about OR	76,383	82,890
General Publicity	63,931	45,902
Third Sector Pro Bono	31,530	33,340
Sponsorship of OR Conferences	0	0
Medals, Awards and Scholarships	28,601	23,231
Strategic Initiatives	148,015	108,497
Other Costs	<u>8,191</u>	<u>4,069</u>
Total	<u>422,462</u>	<u>356,297</u>
5 GOVERNANCE AND SUPPORT COSTS		
Board and Committees	108,683	85,330
Auditors' Fees :		
for audit	7,450	6,550
for other services	850	1,044
Other Legal and Professional Fees	15,003	19,931
	<u>131,986</u>	<u>112,855</u>

OPERATIONAL RESEARCH SOCIETY

NOTES TO THE ACCOUNTS FOR THE YEAR ENDED 31 DECEMBER 2019 (continued)

6 TOTAL RESOURCES EXPENDED

Expenditure analysed by type of cost :

	<u>Staff Costs</u>	<u>Other Costs</u>	<u>Depreciation &Amortisation</u>	<u>Total 2019</u>	<u>Total 2018</u>
	£	£	£	£	£
Investment Management Costs	-	12,192	-	12,192	11,645
Subscriptions	92,091	54,958	2,679	149,728	106,689
Events and Conferences	82,010	294,602	5,567	382,179	351,025
Training	22,657	78,775	636	102,068	100,883
Publications	103,054	240,631	3,004	346,689	255,350
Accreditation	5,847	662	1,265	7,774	4,370
Websites	103,785	37,927	54,050	195,762	181,794
Other Charitable Expenditure	253,615	161,858	6,989	422,462	356,297
Governance and Support Costs	67,822	62,271	1,893	131,986	153,578
	<u>730,881</u>	<u>943,876</u>	<u>76,083</u>	<u>1,750,840</u>	<u>1,521,631</u>

Staff costs :

Wages and Salaries	609,069	629,643
Social Security Costs	58,189	59,317
Pension Costs	63,623	60,945
	<u>730,881</u>	<u>749,905</u>

The average number of employees of the Society, calculated on a full time equivalent basis, during the year was :

	<u>2019</u>		<u>2018</u>	
	FTE	Headcount	FTE	Headcount
Charitable activities	13.3	13.7	13.8	14.3
Management and administration	3.3	4.1	3.4	4.3
	<u>16.6</u>	<u>17.8</u>	<u>17.2</u>	<u>18.6</u>

During this and the previous year one employee of the Society earned between £80,000 and £90,000 excluding pension contributions. Contributions of £9,063 were paid to their pension scheme (2018 - £8,609)

The key management personnel of the Society comprise the trustees and the Secretary and General Manager. The total employee benefits of the key management personnel of the Society were £93,102 (2018 - £85,869)

No remuneration was paid or is payable to Trustees for service on the Board for the year (2018 - £Nil)

During the year 10 Trustees (2018 - 10 Trustees) received a total of £6,965 (2018 - £7,939) in reimbursement of expenses incurred on Society business .

Other external costs include :	<u>2019</u>	<u>2018</u>
	£	£
Other Operating Leases	<u>3,655</u>	<u>3,655</u>

OPERATIONAL RESEARCH SOCIETY

NOTES TO THE ACCOUNTS FOR THE YEAR ENDED 31 DECEMBER 2019 (continued)

7 INTEREST RECEIVABLE AND SIMILAR INCOME

	<u>2019</u>	<u>2018</u>
	£	£
Income from Listed Investments	52,941	49,080
Interest on Bank Deposits	0	0
Distributions - CAF	1,962	1,816
	<u>54,903</u>	<u>50,896</u>

8 FIXED ASSETS

	-----Tangible-----				Intangible
	Long Leasehold Land and <u>Buildings</u>	Office <u>Equipment</u>	Fixtures & <u>Fittings</u>	<u>Total</u>	<u>Software Systems</u>
	£	£	£	£	£
Cost					Cost
At 31 December 2018	314,306	124,476	90,192	528,974	936,911
Additions	-	20,718	-	20,718	17,536
Disposals	-			0	
Write offs					(747,775)
At 31 December 2019	<u>314,306</u>	<u>145,194</u>	<u>90,192</u>	<u>549,692</u>	<u>206,672</u>
Depreciation					Amortisation
At 31 December 2018	157,150	109,854	41,141	308,145	764,325
Charge for the Year	6,286	14,833	3,247	24,366	51,717
Disposals	-			0	
Write offs					(747,775)
At 31 December 2019	<u>163,436</u>	<u>124,687</u>	<u>44,388</u>	<u>332,511</u>	<u>68,267</u>
Net Book Value					Net Book Value
At 31 December 2019	<u>150,870</u>	<u>20,507</u>	<u>45,804</u>	<u>217,181</u>	<u>138,405</u>
At 31 December 2018	<u>157,156</u>	<u>14,622</u>	<u>49,051</u>	<u>220,829</u>	<u>172,586</u>

Capital expenditure authorised but not contracted for at 31 December 2019 and not provided for in the accounts amounted to £70,050 (2018 - £57,750).

The Trustees consider the market value of the Long Leasehold Land and Buildings to be materially in excess of the book written down value shown above.

The Trustees do not consider that the difference can be accurately defined without the benefit of a professional valuation.

Amortisation is allocated across the various expenditure categories within the Statement of Financial Activities. Please see Note 6 for further information.

OPERATIONAL RESEARCH SOCIETY

NOTES TO THE ACCOUNTS FOR THE YEAR ENDED 31 DECEMBER 2019 (continued)

9 LISTED INVESTMENTS AT MARKET VALUE

	<u>2019</u> £	<u>2018</u> £
Market Value at 1st January	1,480,746	1,554,759
Additions at Cost	172,771	202,141
Proceeds on Disposal	(108,588)	(172,022)
Net Investment Gain /(Loss)	187,899	(104,132)
Market Value at 31st December	<u>1,732,828</u>	<u>1,480,746</u>
Cost	<u>1,324,699</u>	<u>1,258,067</u>

All the above investments are either listed on a recognised stock exchange in Great Britain or are represented by unit trusts which are traded on a daily basis in the UK, and fall within the wider range of investments as defined by the Trustees Act 1961.

The Society's narrower range of investments as defined by the Trustees Act 1961 is covered by deposits held at Investec.

10 CHARITIES AID FOUNDATION

At 31 December 2019 this investment is represented by 56,058 (2018 - 56,058) shares in the FP CAF Fixed Interest B Accumulation Fund, having a market value of £73,600 (2018 - £67,437).

	<u>2019</u> £	<u>2018</u> £
Market Value at 1st January	67,439	69,675
Net Investment Gain /(Loss)	4,199	
Distributions not remitted	<u>1,962</u>	
	6,161	(2,236)
Market Value at 31st December	<u>73,600</u>	<u>67,439</u>
Cost	<u>56,060</u>	<u>56,060</u>

OPERATIONAL RESEARCH SOCIETY

NOTES TO THE ACCOUNTS FOR THE YEAR ENDED 31 DECEMBER 2019 (continued)

11 DEBTORS

	<u>2019</u>	<u>2018</u>
	£	£
Trade Debtors	72,316	1,037,577
Taxation Recoverable	32,534	9,112
Prepayments	59,741	54,912
Accrued Income	96,849	16,665
	<u>261,440</u>	<u>1,118,266</u>

12 CREDITORS

	<u>2019</u>	<u>2018</u>
	£	£
Trade Creditors	51,185	13,572
Other Creditors	16,718	12,580
Taxation and Social Security	0	136,294
Accruals	94,207	90,048
Deferred Income	35,548	855,387
	<u>197,658</u>	<u>1,107,881</u>

<i>Deferred income brought forward</i>	855,387
<i>Released to incoming resources during the year</i>	(855,387)
<i>Deferred income arising in the year</i>	<u>35,548</u>
<i>Deferred income carried forward</i>	<u>35,548</u>

Deferred income consists of 2019 subscription income paid in advance and income relating to 2019 publications income and Journalist expenses invoiced in advance.

13 FINANCIAL COMMITMENTS

At 31st December 2019 the Society had commitments under other non-cancellable operating leases as follows :

	<u>2019</u>	<u>2018</u>
	£	£
Expiry date :		
Under one year	3,499	3,655
Two to five years	4,315	6,228
Over five years	563	-
	<u>8,377</u>	<u>9,883</u>

The Society has a commitment to a service charge on the car park of the leasehold property over the next 90 years estimated at £263,610 (Under one year £3,030; Two-five years £12,120; Over five years £248,460). These items are not shown in the above table.

OPERATIONAL RESEARCH SOCIETY

NOTES TO THE ACCOUNTS FOR THE YEAR ENDED 31 DECEMBER 2019 (continued)

14 RELATED PARTY TRANSACTIONS

A member of Key Management Personnel is a Director of Edward Street Management Limited, the company that manages the Society's buildings car park. During the year the Society paid rent to the company of £3,030 (2018 - £3,636). As at 31 December 2019 there was a creditor balance owing to Edward Street Management Limited of £Nil (2018 - £3,787).

The wife of a member of key management personnel is employed by the Society. This employee received remuneration of £25,981 (2018 - £24,971) (including employers pension contributions) during the financial year.

15 DESIGNATED FUNDS

The funds of the charity include the following designated funds which have been set aside out of unrestricted funds by the trustees for specific purposes :

(1) Reserve Fund

The reserve fund consists of resources of the Society which are represented by land and buildings, fixed asset investments and a cash deposit with the Society's investment brokers, The Society operates a reserves policy that reflects its critical dependence on journal income.

(2) Designated Award Fund

The Designated Award Fund represents a legacy received in 2002. The Legator, Mrs May Hicks, expressed a non-binding wish that the Society uses its bequest to fund an annual award to be determined by the Council of the Society. The legacy is currently invested in the Charities Aic Foundation Fixed Interest B Accumulation Fund.

**16 STATEMENT OF FINANCIAL ACTIVITIES :
COMPARATIVE FIGURES BY INDIVIDUAL FUND**

	<u>General Fund</u>		<u>Reserve Fund</u>		<u>Designated Award Fund</u>	
	<u>2019</u> £	<u>2018</u> £	<u>2019</u> £	<u>2018</u> £	<u>2019</u> £	<u>2018</u> £
INCOME FROM :						
Charitable activities	1,494,701	1,386,785	-	-	-	-
Investment income	0	0	52,941	49,080	1,962	1,816
Total	<u>1,494,701</u>	<u>1,386,785</u>	<u>52,941</u>	<u>49,080</u>	<u>1,962</u>	<u>1,816</u>
EXPENDITURE ON :						
Raising funds	-	-	12,192	11,645	-	-
Direct charitable expenditure	1,728,512	1,499,875	8,636	8,612	1,500	1,500
Total	<u>1,728,512</u>	<u>1,499,875</u>	<u>20,828</u>	<u>20,257</u>	<u>1,500</u>	<u>1,500</u>
Investment Gains/(Losses)	-	0	187,899	(103,692)	4,199	(4,052)
Net Income/(Expenditure)	<u>(233,811)</u>	<u>(113,090)</u>	<u>220,012</u>	<u>(74,869)</u>	<u>4,661</u>	<u>(3,736)</u>

17 ANALYSIS OF NET ASSETS BETWEEN FUNDS

	General Fund £	Reserve Fund £	Designated Award Fund £	Total £
Tangible Fixed Assets	66,311	150,870	-	217,181
Intangible Fixed Assets	138,405	-	-	138,405
Investments	-	1,732,828	73,600	1,806,428
Cash Deposited with Investment Brokers	-	29,047	-	29,047
Net Current Assets/Liabilities	231,013	(3,348)	(14,705)	212,960
Total Net Assets	<u>435,729</u>	<u>1,909,397</u>	<u>58,895</u>	<u>2,404,021</u>

18 RECONCILIATION OF MOVEMENTS IN UNREALISED (GAINS)/LOSSES ON INVESTMENT ASSETS

	Reserve Fund	Designated Award Fund £	Total £
Unrealised gains at 31 Dec 2018	222,679	(2,745)	219,934
Realised investment (gains) / losses during the year	(1,431)	-	(1,431)
Net unrealised investment gains/ (losses) arising during the year	186,881	4,199	191,080
Unrealised (losses)/gains included in net assets at 31 Dec 2019	<u>408,129</u>	<u>1,454</u>	<u>409,583</u>

DISPOSAL OF INVESTMENTS

	Cost £	Proceeds £	Book Gain/(Loss) on Disposal £	Realised Revaluation Gain/(loss) £
Reserve Fund	<u>106,139</u>	<u>108,588</u>	1,018	<u>1,431</u>
Net unrealised investment gains/ (losses) arising during the year as above			186,881	
Per Statement of Financial Activities			<u>187,899</u>	

OPERATIONAL RESEARCH SOCIETY

NOTES TO THE ACCOUNTS FOR THE YEAR ENDED 31 DECEMBER 2019 (continued)

19 PENSION FUND

The Society contributes to individual pension schemes established for each individual employee. The assets of these schemes are held separately from those of the Society in independently administered funds. The pension charge represents contributions payable by the Society to the schemes and amounted to £63,623 (2018 - £60,945). Pension payments outstanding at the end of the year were £142 (2018 - £11,672).

20 POST BALANCE SHEET EVENTS

Since the date of these accounts the global COVID -19 pandemic has taken hold. This has resulted in the cancellation and postponement of many of our events, conferences and training courses. This will impact on our income for the financial year 2020. We have re-budgeted and prepared cash flow forecasts which indicate that COVID -19 will not impact our status as a going concern. We expect to resume activities as normal as soon as possible.

History

In the autumn of 1947, at a dinner discussion convened at the Athenaeum Club in London, it was decided to form the Operational Research Club. The club was inaugurated in April 1948 with an initial membership of 50, under the chairmanship of Sir Charles Goodeve and with Mr J A Jukes as the first secretary. The exclusivity associated with the word “club” was deliberately chosen for the initial period, to ensure clarification of what was meant by operational research and to attempt to develop a wholeness in what was otherwise a somewhat vague field. The club met regularly in the rooms at the Royal Society for technical discussions. By 1953 the initial objectives had been achieved and the pressure to form a normal “learned and professional” society had become strong. Therefore, the club was transformed into The Operational Research Society and its first president was Sir Owen Wansbrough-Jones and the hon secretary Mr B H P Rivett.

Presidents of the Society

Sir Owen Wansbrough-Jones	1954/55
Sir William K Slater	1956/57
Professor M G Kendall	1958/59
The Earl of Halsbury	1960/61
Professor B H P Rivett	1962/63
Professor G A Barnard	1964/65
Professor R T Eddison	1966/67
Mr E C Williams	1968/69
Mr S Beer	1970/71
Professor K D Tocher	1972/73
Mr R C Tomlinson	1974/75
Mr A M Lee	1976/77
Professor M G Simpson	1978/79
Mr G H Mitchell	1980/81
Professor K B Haley	1982/83
Dr R S Stainton	1984/85
Professor J V Rosenhead	1986/87
Dr J C Ranyard	1988/89
Mr P N Thornton	1990/91
Professor C B Chapman	1992/93
Professor L C Thomas	1994/95
Mr I J Disley	1996/97
Professor R G Dyson	1998/99
Professor M Pidd	2000/01
Mr J Gibb	2002/03
Professor V Belton	2004/05
Professor J D Griffiths	2006/07
Mrs S M Merchant	2008/09
Professor R W Eglese	2010/11
Dr G H Royston	2012/13
Professor S L Robinson	2014/15
Ms R A Kaufman OBE	2016/17
Mr J R Hopes	2018/19
Professor E K Burke	2020/21

OR Society Awards

Companion of Operational Research

Sir Hermann Bondi	1983	Professor R G Dyson	2007
Mr D Hicks	1983	Mr E K G James	2007
Professor R V Jones	1983	Professor J Friend	2008
Professor B H P Rivett	1983	Dr G Royston	2008
Mr H R W Watkins	1984	Professor R J Paul	2009
Professor Sir David Cox	1985	Professor A Mercer	2010
Lord Ezra	1985	Mr T O'Connor	2010
Mr P Hughes	1985	Professor V Belton	2011
Lord Zuckerman	1985	Ms R A Kaufman	2011
Sir John Kingman	1986	Professor M Pidd	2011
Sir Dennis Rooke	1986	Professor P H Millard	2012
Sir Charles Carter	1987	Professor D M Ryan	2013
Mr T P Frost	1987	Professor R M Davies	2014
Professor H.Muller-Merbach	1988	Mr C R Humby	2014
Mr D A Quarmby	1989	Mrs S M Merchant	2015
Professor R C Tomlinson	1990	Professor S C Brailsford	2016
Mr R A Showell	1991	Professor J D Griffiths	2016
Mr G H Mitchell	1992	Professor E K Burke	2017
Professor P Whittle	1994	Professor P R Harper	2018
Mr J Plymen	1994	Professor R W Eglese	2019
Professor S Vajda	1995		
Professor K B Haley	1996		
Professor M F Shutler	1996		
Professor D J White	2001		
Professor K C Bowen	2001		
Dr R A Forder	2005		
Professor F Kelly	2005		
Mr G K Rand	2005		
Dr J C Ranyard	2005		
Professor J V Rosenhead	2005		
Dr J F Miles	2006		

Beale Medal

J V Rosenhead	1992	J D Griffiths	2009	R Cheng	2018
D J White	1993	K H Haley	2010	A Land	2019
A H Christer	1995	F Kelly	2011		
G H Mitchell	1998	M D Elder	2012		
H P Williams	1999	K D Glazebrook	2013		
R C Tomlinson	2005	R Fildes	2014		
P Checkland	2006	J Friend	2015		
C Eden	2007	R Ormerod	2016		
L C Thomas	2008	M Jackson	2017		

Silver Medal

C F Goodeve	1964	A M Lee	1970	S Eilon	1982
P M Morse	1965	R L Ackoff	1971	G Dantzig	1986
K D Tocher	1967	C G Vickers	1975	L V Kantorovich	1986
B H P Rivett	1968	E.K.G.James	1979		
R T Eddison	1969	E M L Beale	1980		

Bronze Medal

R M Adelson	1965	A R Wild	1967	F K Lyness	1970
J Stringer	1967	D J Chambers	1968	A M Duguid	1972
T A Burgin	1967	M F Cantley	1969	C G Moss	1972

Goodeve Medal

B H Mahon	1976	J Banasik	2000	S Kapoor	2012
R J M Bailey	1976	J N Crook	2000	A Sheth	2012
N R Tobin	1977	L C Thomas	2000	R True	2012
I Sanderson	1979	K Korporaal	2001	P Kemmer	2013
A J Williams	1980	A Ridder	2001	A Strauss	2013
J G Shepherd	1981	P Kloprogge	2001	T Winter	2013
F K Lyness	1982	R Dekker	2001	J Bengtsson	2014
L P Fatti	1984	S Howick	2002	D Bredstrom	2014
A H Christer	1985	C Eden	2002	P Flisberg	2014
W M Waller	1985	J E Beasley	2003	M Ronnqvist	2014
G Best	1987	H Howells	2003	S Crowe	2015
G Parston	1987	J Sonander	2003	P Bennett	2015
J V Rosenhead	1987	R Hartley	2004	M Daraktchiev	2015
D Rowland	1988	G Lanot	2004	M Utley	2015
I R Turner	1989	S C Brailsford	2005	S C Brailsford	2016
R Bandyopadhyay	1990	V Lattimer	2005	D De Silva	2016
S Datta	1990	P Tarnaras	2005	A Backiel	2017
D Schrady	1992	J Turnbull	2005	B Baesens	2017
D Wadsworth	1992	K Taylor	2006	G Claeskens	2017
A Bouzاهر	1993	B Dangerfield	2006	A I Ali	2018
S Offutt	1993	S C Brailsford	2007	G Ince	2018
D W Bunn	1994	D Evenden	2007	A Brice	2019
E R Larsen	1994	V Harinda	2007	R Bye	2019
K Vlahos	1994	P Harper	2007	J Oppen	2019
G M Campbell	1995	A Medina-Borja	2008	J Royset	2019
C F Davis	1995	K S Pasupathy	2008		
M Carey	1996	K Triantis	2008		
D Lockwood	1996	D Ronen	2009		
C M Yeats	1997	C A Goodhart	2009		
T Rehman	1997	S Kumar	2010		
D-W Tcha	1998	D A Nottestad	2010		
T-J Choi	1998	E E Murphy	2010		
Y-S Myung	1998	L C Thomas	2011		
F Duckworth	1999	F R Johnston	2012		
A J Lewis	1999	E A Shale	2012		

Stafford Beer Medal

JJ Jahng	2003	P O'Reilly	2011	R Parks	2018
H Jain	2003	P Flanagan	2011	H Xu	2018
K Ramamurthy	2003	R Lederman	2012	C-H Chu	2018
R Lindgren	2004	R Johnston	2012	P Lowry	2018
D Stenmark	2004	H Koch	2013	N Hikmet	2019
J Ljungberg	2004	E Gonzalez	2013	A Connolly	2019
S Sarker	2005	D Leidner	2013	C Davis	2019
S Sahay	2005	D Denyer	2014	A Bhattacharjee	2019
S Madon	2006	M Hall	2014		
C Middleton	2007	E Kutsch	2014		
W Cukier	2007	E Lee-Kelley	2014		
S K Sia	2008	P Tallon	2015		
C Soh	2008	J Gerow	2016		
C Ashurst	2009	J Thatcher	2016		
N Doherty	2009	V Grover	2016		
J Peppard	2009	A Utesheva	2017		
F Thiesse	2010	J Simpson	2017		
J Al-Kassab	2010	D Cecez-	2017		
E Fleisch	2010	Kecmanovic			

Tocher Medal

K Kotiadis	2009	C-Y Kuo	2015	M Cabrera-Rios	2019
T Pitana	2011	J Xu	2017	D E Arias	2019
E Kobayashii	2011	E Huang	2017	Gonzalez	
C Boer	2013	L Hsieh	2017	E Nino-Perez	2019
Y Saanen	2013	L H Lee	2017	Y M Mendez-	2019
K-H Chang	2015	Q Jia	2017	Vazquez	
A-L Chang	2015	C Chen	2017		

Cook Medal

P Jackson	2014	D MacIver	2016	F Di Vincenzo	2018
J Klobas	2014	M Walsh	2016	D Mascia	2018
D Pentland	2016	R Murray	2016		
K Forsyth	2016	L Irvine	2016		

Griffiths Medal

H Witteman	2015	G Vanden Berghe	2017	V Caldwell	2019
J Stahl	2015	V Mabin	2019		
M Mihaylow	2017	J Yee	2019		
P Smet	2017	S Babington	2019		
W Van Den Noortgate	2017	R Moore	2019		

Lyn Thomas Impact Medal

S Crowe	2019	M Utley	2019		
C Pagel	2019				

Doctoral Award

K Kaparis	2008	T Lidbetter	2013	G Palmer	2018
A Strauss	2009	M Takac	2014		
F Liberatore	2010	C Koc	2015		
R Wood	2011	I Megiddo	2016		
K Rustogi	2012	J F Sze	2017		

President's Medal

D R Corkindale	1976	D Bright	2000	R Dorne	2016
M L Chambers	1977	V Kocatulum	2000	A Mohamed	2016
R G Dyson	1977	E Wolf	2000	A McCormick	2016
M Sloman	1978	J Moffat	2000	A Liret	2016
J V Rosenhead	1979	J J Race	2001	O Buhlinger	2017
P Doyle	1980	D Burnell	2001	C Henzel	2017
J Fenwick	1980	M Neighbour	2002	M Clocherty	2017
G P Savage	1980	M Acutt	2003	M Knapton	2017
D B Gilding	1981	P Loader	2004	H Papachristou	2017
C Lock	1981	M Bryant	2004	C Legge	2017
B Fokkens	1982	P Bates	2004	R Leese	2018
M Puylaert	1982	C McGuckin	2004	J Blaavand	2018
R S Hambleton	1983	D Kelly	2004	C Centazzo	2018
A W Nimmo	1984	P Loucopoulos	2005	A Bejan	2018
C B Chapman	1985	KG Zagrafos	2005	P Munday	2018
D F Cooper	1985	Y Pyrgiotis	2005	M Wauben	2019
A B Cammaert	1985	D Beis	2005	P Macdent	2019
P Doyle	1987	A Swain	2006	B Marshall	2019
J Saunders	1987	A Ross	2006	A Booker	2019
M Pidd	1988	A Lewins	2007		
S R Clarke	1989	M Sykes	2007		
A H Christer	1990	A Moon	2007		
K A H Kobbacy	1990	M Allwright	2008		
B C Dangerfield	1991	J Ball	2008		
C A Roberts	1991	D Pankhurst	2008		
M B Wright	1992	I Wright	2008		
C P Thunhurst	1993	P Frangos	2010		
C J Ritchie	1993	S Hughes	2010		
A Khakee	1994	S Hammond	2011		
K Stromberg	1994	K Slater	2011		
J J Glen	1996	C Marston	2012		
H Tsoukas	1997	P Rose	2012		
D B Papoulias	1997	S Mardle	2013		
J H Powell	1998	L Fildes	2013		
G Laporte	1999	A Lewins	2013		
F Semet	1999	E Husemann	2014		
V V Dadeshidze	1999	D Lane	2014		
L J Olsson	1999	E Munro	2014		
F Vasko	2000	G Owusu	2016		
H Gilles	2000	S Shakya	2016		



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