

# Special feature: GAD's work with universities

The Government Actuary's Department (GAD) has been working closely with universities in various capacities. This has enabled future actuaries, analysts and data scientists to gain an understanding of what GAD does while providing valuable input into the department's work. GAD's collaboration with universities has included:

- careers fairs, talks and work placements
- joint projects with university students and lecturers
- sharing or co-hosting events with universities

As a learning organisation GAD is committed to expanding areas of expertise to keep up with current needs, and universities have valuable and fresh research in these fields.

## **Careers fairs, talks and work placements**

People in GAD have attended careers fairs and given talks to university students on our general work and specific projects. This has helped students understand more about the wide variety of projects and work GAD are involved with and offered a commercial awareness of the working world. It has given students an insight into what it's like to work for the Civil Service. Work placements have provided them with work experience while providing valuable input into GAD's work.

## **Joint projects**

The sections below outline some of the bigger projects carried out by university students and researchers in collaboration with GAD. These projects have provided participants with valuable experience in data analytics and actuarial skills with an industry expert from GAD providing guidance and project management.

Working with universities has enabled GAD to gain insights into the latest analytical techniques which will allow us to deliver value to clients in a cost-effective way. It has also enabled GAD to tap into expertise and software which is not available in-house.

"Working on a university project with GAD was an enriching academic and professional experience. As a team of MSc students, we were able to meaningfully engage with a project to combine our academic backgrounds with the actuarial role of our project lead.

"We received constant support, where over a period of 4 months we were encouraged to learn about the work of GAD and how our data science backgrounds can contribute to such projects in our careers moving forward."

MSc student at the University of Manchester

“It was interesting to apply myself to a completely new area which pushed us to be innovative and come up with a novel solution. This experience allowed me to develop some vital skills that will be invaluable to my future career.”

MSc student at the University of Manchester

“This is an open-ended project giving us time to bring information and data together. My research colleagues helped me throughout. We applied different skills to the project, learned to collaborate and gained insights into practical issues.” MSc student at Bayes Business School

**Mortality predictors** – Students worked on a project to analyse the correlation between mortality and factors which could be impacting mortality. Factors analysed included climate change and spending on the NHS. The students used regression models with time lags built in to determine whether there was a link.

Although the findings were inconclusive it was still useful to explore something the industry has been considering for several years. The students produced insightful analysis and used innovative illustrations to communicate the outputs.

**Local government risks** – Data science students gathered information on what risks the local authorities and blue light services are insuring.

They looked at how the risks differ between authorities and how, if commercial insurance is not being obtained, risks are being mitigated through self-funding.

The students gained experience in sourcing data and presenting it. They also learned about the commercial insurance market with a GAD industry expert on hand to answer questions. The project looked at the value of commercial insurance and other alternatives.

**Academies' flood claims** – Students undertook a project to analyse flood related claims in academies across England.

They analysed historic, average temperatures to determine what could happen to the frequency and severity of flooding claims in the future.

Students at the University of Manchester used geospatial software to produce flood maps to determine the impact by region. They then produced an interactive dashboard to present the findings.

## **Impact of COVID-19**

COVID-19 has had a profound impact on our lives since the beginning of the pandemic. GAD is taking forward several projects aimed at better understanding these impacts and considering how they may affect future government decision making.

**NHS services** – One current project is looking at the impact that COVID-19 has on NHS services. Students have been assigned to collate and understand various sources of public information and then to analyse the changes in activity over time, and specifically during 2020. This will feed into future work analysing NHS activity, such as waiting times, maternity services, staff absences and NHS staffing levels.

**Mortality impact** – Another project will analyse the mortality experience of pensioners in public service pension schemes over the pandemic, to better understand the impact of COVID-19. Students will analyse excess deaths in the scheme, and then compare this with wider UK population statistics. Subgroups will also be analysed to identify how excess deaths have been distributed across the membership. This will feed into various GAD projects, such as our valuation of the expected future costs of the public service pension schemes.

**Pandemic insurance** – GAD has been supporting [the Bayes Business School work on pandemic insurance](#). COVID-19 has illustrated the devastating impact that pandemics can have on businesses with widespread interruption of activities.

While business interruption insurance covers some losses in the event of disruptions, the gap in business interruption cover for pandemics is enormous. Members of the Association of British Insurers expect to pay £2 billion for COVID-19 business interruption insurance. However, this represents only a small fraction of the costs.

The Office for Budget Responsibility estimates the government will spend £75 billion on supporting businesses, with additional losses falling on businesses themselves. While some of this gap can be addressed through more business interruption insurance cover, comprehensive pandemic business interruption is unlikely to be available and affordable.

The Bayes Business School is reviewing and developing novel risk-sharing mechanisms to effectively share pandemic risk between businesses, insurers, and government.

Given our experience in this area, GAD has been supporting this work by participating in focus groups and workshops. We hope our insights can help further thinking about the appropriate framework for future responses in this area.

The Bayes Business School Report is due to be published later in the year.

## **Sharing and co-hosting events**

GAD has a reciprocal relationship with universities, where invitations are sent out to students and lecturers on any relevant webinars or internal knowledge shares, and vice versa.

GAD and academia hosted joint events about actuaries in the data science field and actuarial work coming out of the pandemic. We have also shared knowledge about machine learning to enhance one another's understanding of how it can be used.

Collaborating on these events has allowed GAD and academics to work together to create models that are fit to support clients consider emerging areas of concern.

## **Working with universities reflects GAD's strategy**

"The public sector is facing new and growing challenges which require greater actuarial support, including the COVID-19 pandemic, climate change risks, cyber risks, social care needs and a rapidly evolving economy.

"Central to our strategy is being a learning organisation, challenging ourselves to keep our skills up-to-date and to apply the full range of tools available to us, particularly in the field of data analytics." Martin Clarke, Government Actuary, taken from GAD's Strategic Plan 2020-25

The students of today are our employees of tomorrow. The projects undertaken with universities provide valuable insight into public services and demonstrate the value of these types of partnerships.

We will continue to welcome the opportunities to:

- be an industry partner for research projects
- provide placement opportunities for students through their courses
- learn about how the university research can be applied to the public sector work GAD undertakes

Collaborating with university students and academia is important to GAD's work. As a learning organisation GAD is committed to expanding areas of expertise to keep up with current needs, and universities have valuable and fresh research in these fields.