



eNews from GAD

Supporting effective decision-making and robust reporting

Issue 30, December 2017



Welcome to eNews – GAD's regular newsletter.

After many natural disasters directly affecting the developed world, for example Hurricane Irma this year, we are used to hearing about losses being recovered from insurance policies and governments restoring damaged infrastructure. However, poorer countries often do not have access to this comprehensive level of financial support. In this issue Daniel Clarke explains how the UK government is acting to address this with the creation of the Centre for Global Disaster Protection, and how GAD actuaries are using their expertise to help contribute towards the effectiveness of this and other similar initiatives.

As with natural disasters, in many other areas GAD clients and UK public sector decision makers face the issue of how to plan and make decisions in the face of considerable uncertainty about the future. Jenny Bullen looks at the past accuracy of the Office of National Statistics population projections, used in numerous areas of GAD work, and considers how we can nevertheless still make effective judgements with uncertain information.

Finally Martin Lunn covers an example of these principles in our quinquennial review of the UK National Insurance Fund.

I hope that you enjoy this issue. As always, previous issues of eNews are available on our website www.gov.uk/gad.

MARTIN CLARKE, GOVERNMENT ACTUARY

NEWS FROM GAD

New GAD Finance Director

Urvashi Bhagat has joined GAD as our new director of finance. Urvashi has extensive experience of leading finance functions and implementing transformational change. She has worked across wider public sector organisations, most recently in the NHS. We thank her predecessor Rob Mackintosh for all he has done in keeping GAD running smoothly during his time here and wish him success in his new role at ACAS.

Government sale of student loans

The UK government has [completed](#) the sale of a tranche of outstanding English student loans that entered repayment between 2002-6. This raised £1.7 billion for public finances. GAD provided extensive support in the building of the model used to value the loans.

GAD paper on self driving cars

This [paper](#) summarises some of the major issues and opportunities that the shift towards self-driving cars poses for government, the insurance industry and the wider economy.

DEVELOPMENTS

Changes to the actuarial qualification

The Institute and Faculty of Actuaries (IFoA) has launched a [consultation](#) on a proposal to change the way actuaries qualify. The key proposal is to introduce a new initial generalist qualification, known as a Chartered Actuary. Those who wish to can then progress on to qualify as a Fellow, the current specialist qualification. GAD will be responding to this consultation in the New Year and we'd like to take into account the views of users of actuarial information. If you would like to contribute your views, please [get in touch](#) or, alternatively, please feel free to respond directly to the IFoA.

Scottish Budget

The Scottish Government's Finance Secretary set out his [draft spending plans](#) for 2018-19 on 14 December. The [Draft Budget](#) includes proposals to [reform income tax bands](#) and rates in Scotland and sets out proposed [public sector pay policy](#) for devolved public bodies. This [factsheet](#) explains the Budget process in Scotland.

Autumn Budget 2017

The Chancellor delivered his [Autumn Budget](#) on 22 November. Please see GAD's [Technical Bulletin](#) for details of some of the measures announced. GAD will be supporting HM Treasury on the review of the government's balance sheet announced in the Autumn Budget. This review is intended to make more effective use of the government's holdings. Looking ahead, the government has confirmed the [Spring Statement 2018](#) will take place on 13 March and published [guidance](#) on the new tax consultation timetable.

Pension Protection Fund update

At the end of September the PPF published its [Levy Estimate](#) for 2018-19. Since then, the PPF has launched a [consultation](#) on contingent assets in the PPF levy and updated its [Statement of Investment Principles](#) and there have been two DWP [consultations](#) in relation to the PPF's treatment of bridging pensions. Earlier this month, the PPF published the 12th edition of [The Purple Book](#), providing comprehensive data and analysis on the defined benefit pensions' landscape.

THE NEW CENTRE FOR GLOBAL DISASTER PROTECTION

The new Centre for Global Disaster Protection will support the world's poorest countries by helping them to strengthen their disaster planning, and to get finances in place before disaster strikes. This will build their resilience, and enable them to better manage the economic impact of emergencies.

In this article, Daniel Clarke, an actuary at GAD and co-author of 'Dull Disasters? How Planning Ahead Will Make a Difference', discusses why this makes sense and how GAD is contributing.



Daniel Clarke

Why is the Centre needed?

More than 200 million people every year are affected by disasters such as earthquakes, tsunamis, cyclones and flooding in developing countries. [Economic losses across 77 of the world's poorest countries are now reaching, on average, \\$30 billion each year.](#) A recent World Bank study estimated that [disasters force some 26 million people into poverty each year.](#) Climate change will aggravate this.

We know that prevention is better than cure. But nobody can stop the ground from shaking or the wind from blowing. In addition to reducing risks, vulnerable countries need to be able respond to and recover from disasters when they happen.

In rich countries like the UK, over 40% of the costs of disasters are covered by insurance, and governments provide useful protection by, for example, repairing or rebuilding lifeline infrastructure like water, power, and transportation infrastructure quickly.

“disasters force some 26 million people into poverty each year”

However, in the poorest countries [less than 5% are covered](#) by insurance, and government responses are often slow, underfunded, and poorly targeted. Across the world, many people support the fundamental motivation behind humanitarian aid—that saving lives and alleviating extreme suffering are the right thing to do—but international assistance absorbs only around 8% of disaster losses in the most vulnerable countries. The remainder of the human and economic cost is borne by already-vulnerable people. In the short-term, this protection gap can disrupt growth and force people into poverty. Over the long-term, it can erode progress on development.



14 November 2013. Tacloban, Philippines. Typhoon Haiyan, known as Super Typhoon Yolanda in the Philippines, was one of the most intense tropical cyclones on record.

How will the Centre help?

In this context the [UK Humanitarian Reform Policy](#) includes a commitment to help other countries build their resilience, prepare for crises, and manage the risk of crises. This includes using new financing tools such as insurance, concessional loans and contingency funds, working with private sector partners and international financial institutions. The UK government has set up the Centre for Global Disaster Protection to help achieve these aims.

The objective of the Centre is to enable certain developing country governments to shift from crisis responders to risk managers, with the ability to deliver a fast, effective and reliable government-led response to disasters. This will cut the costs of disasters and protect the lives and livelihoods of many millions of people as well as reduce reliance on humanitarian assistance.

It will aspire to protect poor and vulnerable people, save lives, and help developing countries to get back on their

THE NEW CENTRE FOR GLOBAL DISASTER PROTECTION

feet more quickly after a disaster. It will achieve this by working with governments to strengthen their pre-disaster financial planning and to use tools like insurance to provide more cost-effective, rapid and reliable finance in emergencies.

It will do this by providing neutral advice, training, innovative financial tools, and concessional insurance financing for governments. Its location in London will allow it to draw upon the UK's world-renowned skills, innovation and expertise in risk analytics, insurance and risk management, and to act as an access point to global insurance markets.

“The UK insurance industry and the UK Government have a deep pool of expertise on financing disaster risks that can be shared with other governments.”

How will the Centre complement other initiatives?

There has been substantial innovation in disaster preparedness and response in the world's poorest countries over the past 10 years, and some notable systems are already working and demonstrating results. For example, UK aid has supported regional risk insurance pools in the [Caribbean](#), [Pacific](#) and [Africa](#), and in 2017 alone the Caribbean facility paid out over \$60 million to Caribbean governments in response to hurricanes and floods.

Just as risk pools are used in a UK public sector context in some situations, these risk pools - owned by regional governments - are part of a broader basket of budgetary and financial instruments that can be used to pre-fund plans for post-disaster response and reconstruction.

However, experience suggests that financial solutions, by themselves, are not a silver bullet. The World Bank has been at the forefront of innovation in developing countries in this area over the last decade and recently set out its reflections to the G20, around [three pillars for financial risk management for disasters](#):

- a) Pre-disaster planning, systems and capability – having credible plans in place before a disaster strikes as well as capabilities and systems to deliver in emergencies, including “shock-responsive” systems and services.
- b) Pre-agreed triggers – having a pre-agreed decision making process in place that can trigger action, including objective data-driven triggers.

- c) Pre-arranged finance – having finance on stand-by to ensure that funds are quickly available to put plans into action when a disaster strikes.

The Centre will bring together the best and brightest people from the development, humanitarian, science and finance communities, spanning government, civil society and the private sector to build the capabilities, systems and knowledge needed to put these three principles into practice.

What is GAD's role?

The UK insurance industry and the UK Government have a deep pool of expertise on financing disaster risks that can be shared with other governments. The Centre has been designed by the Department for International Development to draw on this deep pool of expertise. In this context GAD will be helping the Centre to develop analytics and advice that can bridge the gap between data and risk-informed decision making through three kinds of input: through representation on the Board; through actuarial secondments into the Centre; and through analytics and advice financed by the Centre.

Is GAD doing other disaster risk financing work?

GAD routinely works with DFID to provide independent analytics and advice to support the development and evaluation of risk financing programmes in developing countries, including insurance pools. We use our insurance and risk expertise to perform quantitative and qualitative analysis of the programmes and their risks. Beyond this, we also occasionally support DFID-funded development institutions, like the World Bank.

Where can I find out more?

For a description of the Centre, please see the [DFID business case](#).

For a visual introduction to this topic we recommend the [video](#) by the Centre for Global Development, developed with input from a working group that GAD contributed to.

For an accessible book on the topic we suggest [Dull Disasters? How Planning Ahead Will Make a Difference](#).

If you're interested in discussing any of these issues with us please contact [Evie Calcutt](#).

HOW CAN WE USE UNCERTAIN LONG-TERM PROJECTIONS EFFECTIVELY?

Long-term estimates and projections are often important in informing decisions such as resource allocation and planning. The UK national population projections produced by the Office of National Statistics are well-known examples. These provide an illustration of the possible future size and age structure of the UK population, but in practice these quantities are highly uncertain.

In this article we compare experience against past projections and consider the implications for using these projections in practice.



Jenny Bullen

What are the national population projections?

The Office of National Statistics published the latest United Kingdom population projections (the 2016-based projections) on 26 October 2017. They give a projection of the future population over the next 100 years.

The projections require assumptions to be made on future fertility, mortality and migration. Each assumption is informed by experts within each specialism and an analysis of recent trends. Together with the starting population for the base year of the projections, they are used to project future births, deaths and net migration.

The population projections are not forecasts, and looking so far into the future introduces a large number of uncertainties. Specifically, no allowance is made for political and economic changes; this might be particularly relevant in the post-referendum period. It is likely that past trends in relation to the number of migrants, for example, are less likely to be replicated but it is not possible to know in advance what the future rates will be.

How accurate have projections been in the past?

The Office of National Statistics itself considers the accuracy of past projections in the [National Population Projections Accuracy Report](#) (the latest such report was published in July 2015). If we look at how historical projections of migration compare to actual migration, we can see considerable fluctuation.

For instance, in contrast to the current levels, prior to the early 1990s net migration was generally negative. Around the early 1990s there was a shift from net negative to net positive migration; however the change in the fundamental long term pattern was not adopted until the 1996-based projections. The 2016-based population projections continue to assume net in-migration and assume that in the next 10 years 5.2 million people will immigrate to the UK, whereas 3.2 million will emigrate.

With so much inherent uncertainty, decisions influenced by future migration need to consider more than just the base projections, as actual events may be very different.

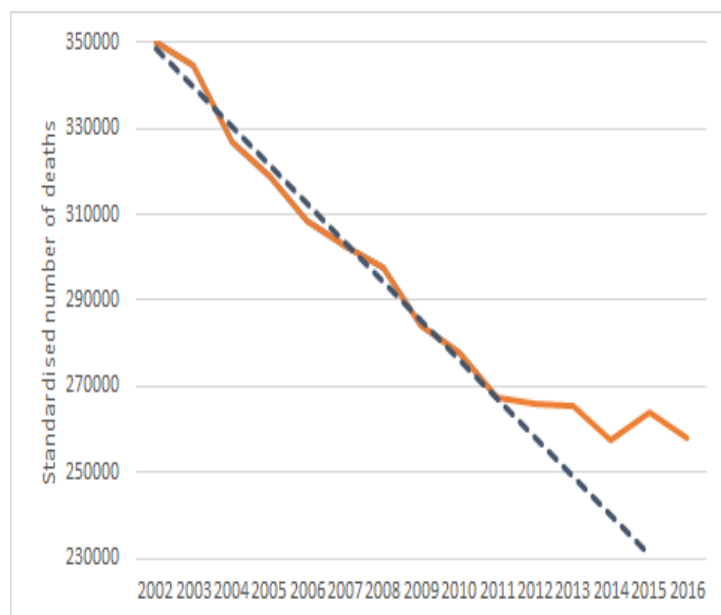


Actual and projected net migration, United Kingdom, 1971 to 2030, selected projections

Source: ONS National Population Projections Accuracy Report July 2015 [section 8 page 17].

“Specifically no allowance is made for political and economic changes; this might be particularly relevant in the post-referendum period.”

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Age standardised* number of deaths per year, Males, UK

Source: GAD analysis

How long people are expected to live is another of the assumptions. Historically the projected life expectancy has fallen short of what has actually been observed. However in more recent years the improvements in UK population mortality rates have slowed down dramatically. The chart above looks at how many deaths we would have observed if the age profile of the UK did not change from year to year. We can see here that whilst the pattern of deaths followed a clear trend line until 2011, since then the pattern has changed; the level of deaths was noticeably above the trend in 2012, 2013 and 2015.

Although this is also likely to be true in relation to 2017, many of the users of projections of future mortality need to consider the appropriate assumptions to use 10, 20, or even 100 years into the future to enable them to plan and manage future risks. Deciding what makes sense over these timescales may need to be supported by more evidence than only that of these recent years.

Age standardised deaths

Since mortality rates increase significantly with higher ages, the number of deaths in a population each year is strongly influenced by the number of people in each age group that year. If we want to compare the rates of mortality between years, we need to adjust the number of deaths in each age group so that the sizes of each age group are equivalent for all the years. This tells us how many deaths would have occurred if the age profile of the UK did not change from year to year. This is the age standardised number of deaths.

With such uncertainty how helpful are projections?

Using projections which have been shown to be inaccurate before may sound questionable, but making no attempt to estimate how the future may unfold is not a sound alternative for basing decisions and planning. However we do need to be aware of the unavoidable uncertainties that exist in any assumption; and to consider how sensitive our own particular work is to such unknown variables.

One way in which we are able to do this is by considering alternative assumptions. The Office of National Statistics produces variant projections alongside the principal population projections and also released extra [variants](#) on 28 November 2017. Other organisations also issue projections. These alternative assumptions should not necessarily be considered realistic but help users consider various “what-if” scenarios.

For example in the context of mortality, as an alternative to the principal projection, users could consider what the impact would be if a “high” life expectancy assumption was observed in the future. If this resulted in a significant change to projected costs then, it would be sensible for users to: monitor changes in future mortality expectations; and adjust their forecasting accordingly. Alternatively if your outcomes are not sensitive to a significant assumption change, then users may be more relaxed about future variations in that assumption.

How does GAD implement this?

Within GAD such sensitivities are typically included within reports and advice. For example, the impact of variation in both short and long term mortality improvements was considered in depth in the Government Actuary’s report [Periodic review of rules about State Pension age](#).

So whilst we don’t know what the future will bring, with the assistance of the Office of National Statistics’ population projections and an understanding of the importance of individual assumptions, users are able to confidently make future projections. However users also need to be aware that the actual experience will differ from any long term projections, and to monitor and be well prepared whatever the actual experience might be.

More information about the Office of National Statistics’ population projections 2016, and what the projected population is in 2116 can be found in the [National Population Projections: 2016-based statistical bulletin](#). Observing all of what happens in practice will fall to future generations.

If you would like to discuss these issues in more depth please get in touch with your usual GAD contact.

THE LONG-TERM OUTLOOK FOR THE NATIONAL INSURANCE FUND

The UK State Pension is the main benefit paid from the Great Britain National Insurance Fund (the Fund) which is financed by workers’ and employers’ National Insurance contributions.

The most recent review by the Government Actuary has again found that under the current arrangements the Fund is projected to be exhausted by the early 2030s. This article looks at these results and some potential implications for providing the State Pension.



Martin Lunnon

Reviewing the National Insurance Fund

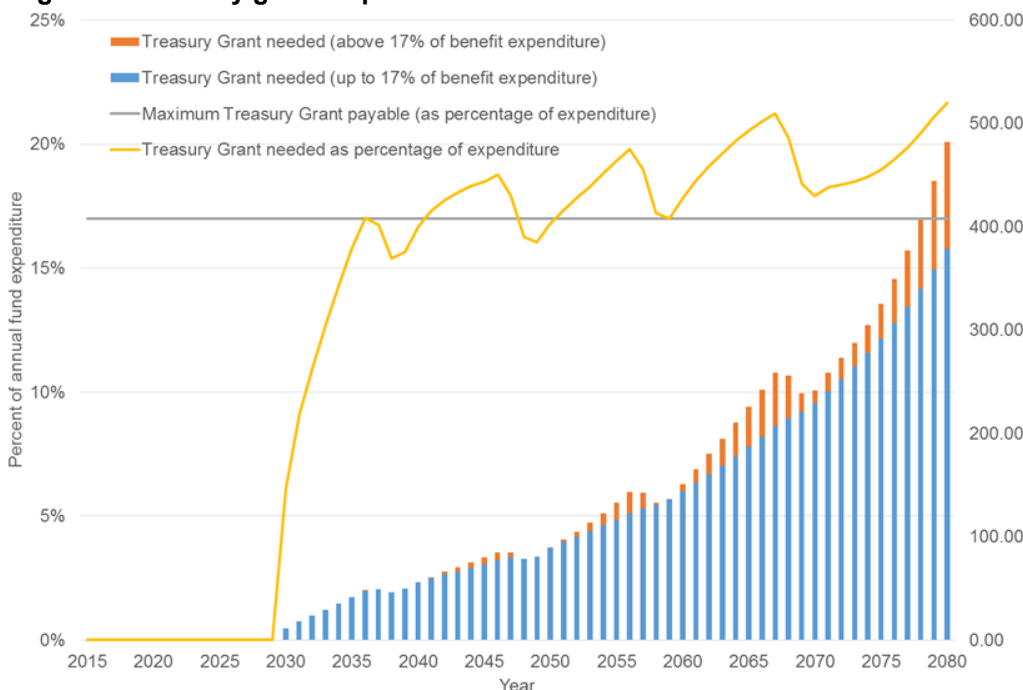
The status and long-term outlook for the Fund are reviewed by the Government Actuary every five years, with [annual fund updates](#) between. The most recent long-term review was [published](#) on 19th October 2017.

The review is based on current policy, such as the State Pension “triple lock”, and provides long-term projections of the income and expenditure of the Fund from 2015 up to 2080. It includes a range of projections to show how varied the future progression of the Fund could be.

Where possible the projections make use of recent data such as Fund accounts. They also use projections of the UK economy and population from the Office for National Statistics and the Office for Budget Responsibility.

We chose assumptions for State Pension age (SPa) in the review based on the [State Pension age review](#), which indicated an expected increase in SPa from 67 to 68 during 2037-39 and a longer term policy intention for SPa to be set with an aim of up to 32% of adult life to be spent in retirement.

Figure 1: Treasury grant required to maintain the Fund after 2030



What the projections show

The current balance in the Fund is comparatively low: just over 1/5th of annual expenditure on benefits. Although it is expected to increase until 2025, after this the balance is expected to fall rapidly to zero around 2032. The [previous review](#) similarly showed that the Fund was likely to be exhausted by the mid-2030s.

What are the implications of Fund exhaustion?

If the system is to continue to cover the current form of State Pension and other benefits, then either the Fund’s income has to rise or expenditure has to be controlled.

“If the current system is to continue ... the Fund’s income has to rise.”

Increasing Fund income

An existing mechanism to boost income is for Parliament to approve a “Treasury Grant”. The Social Security Act 1993 limits the grant in any year to 17% of benefits paid.

Treasury Grants have been used in past years when the balance in the Fund was projected to fall below a minimum balance of 1/6th of annual benefit expenditure.

Could these grants be sufficient to prevent the Fund running out? Sadly not. The chart to the left indicates that the grants needed to keep the Fund above 1/6th annual benefit expenditure exceed the legal maximum in most years from 2040 (each assumed increase in SPa reduces the grant needed for a few years). Of course the 17% limit for the Grant could be lifted, but this would require primary legislation.

THE LONG-TERM OUTLOOK FOR THE NATIONAL INSURANCE FUND

Alternatively National Insurance contributions could be increased. Like the prior review, this review calculated the “break-even contribution rate”. (The aggregate rate required in a year such that income exactly equals benefit expenditure and expenses.)

The chart to the right shows these break-even rates.

- The previous review only considered the increases in SPa to 68 by 2046 and this resulted in a broadly increasing trend to the end of the project period.
- Conversely the additional SPa increases we assumed in this latest review help keep the break-even contribution rate broadly level over the period from 2035 to the end of the projection. Albeit this is at around 5% higher than the current rates.

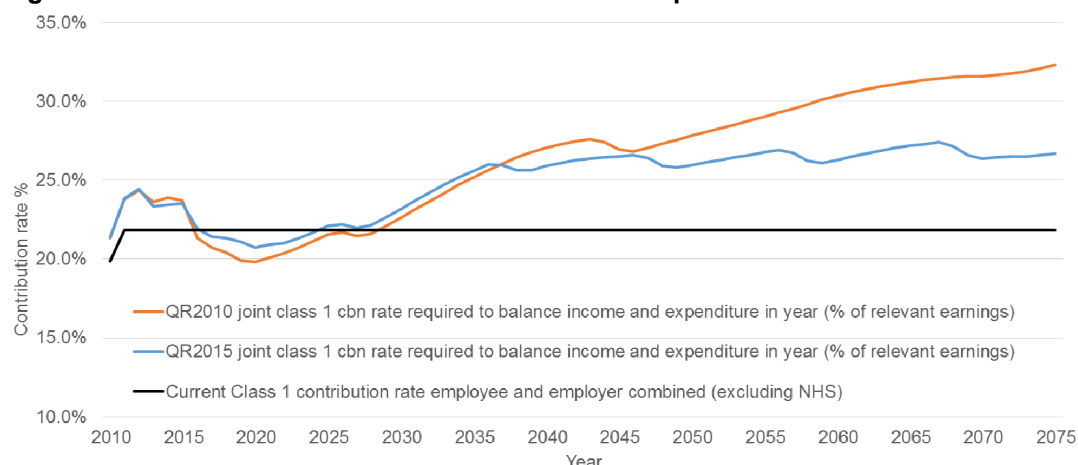
Substantial increases in National Insurance contribution rates would both be particularly politically sensitive and would again require primary legislation.

Controlling benefit expenditure

State Pension benefits are responsible for over 90% of the benefit expenditure from the Fund. Therefore, the long term finances of the Fund will be significantly affected by the level of State Pension benefits paid out in future.

The new State Pension was introduced in April 2016, and both this and the previous review fully reflect this. Changes in the age from which State Pension benefits are paid and how they are increased can have significant impacts on expenditure. Figure 2 above partly illustrates the potential effect on the Fund of raising the SPa to maintain a ratio of up to 32% of adult life in retirement.

Figure 2: Class 1 break-even contribution rates from previous and current Reviews



Some of our variant projections showed variants allowing for even faster increases in SPa (albeit to the same maximum) and replacing “triple lock” indexation with the legal minimum of earnings increases. Though “break even rates” varied significantly in the longer term, these still showed Fund exhaustion by 2035.

Conclusions

These potential resolutions to the lack of long-term sustainability are all difficult and require viewing the Fund in the wider context of public finances. Ongoing monitoring can highlight whether the projections are being borne out or if there is any further deterioration.

The next review, as at 2020, and intervening annual reports will give revised projections, but additional monitoring in both short and long terms could be useful. This review suggests that metrics based on demographic or economic statistics could give advance warning of possible problems. It also suggests that the trigger point for Treasury Grants could be reconsidered.

Such regular monitoring, with suitable actions taken as a result, should ensure that additional funds are found in time to ensure that people continue to receive the State Pensions they expect and thus promote the inter-generational trust on which the system depends.

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For details of our management team and office address please visit:

<https://www.gov.uk/gad#people>

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