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Moving from a dynamic cohort microsimulation model to a dynamic population microsimulation model: an incremental approach for a UK model of long-term care charging (CARESIM)

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[EDITED TRANSCRIPT]

Ruth Hancock: We're going to do this as a double act, so you get me to start off with, then you get Marcello and then you get me again. And yes as Mike has said, this project is also part of the MAP2030 programme and this is Work Package 5 which is looking at the consequences of all the other things that have been looked at for pensions and long term care policy. And so some of the other colleagues here are involved in the project as part of Work Package 5. And what I'm going to be talking about is a dynamic microsimulation model of long term care charges which is called CARESIM.

But just a bit of background, why is this interesting? The long term care system as Mike has indicated continues to be under debate. We have had a series of pension reforms, so while we may not be looking at major reforms of pensions, those pension reforms that we have had will affect the ability of future pensioners to pay for their care. Population ageing, which is at the heart of our project, affects public expenditure on both long term care and pensions, those are the two big public expenditure budgets and arguably one should think about the two together because there may be trade offs and options about which ones you spend more or less on.

Reforms in this area can have major distributive effects and that's one of the main reasons why we want a microsimulation model because we want to be able to look at the effects of those reforms on different parts of the population, in particular on people who are in different parts of income distribution, and a lot of the discussion about particularly long term care reforms is the extent to which the current system is fair in some sense, we argue about what is fair.

Mike said the project as a whole is using a number of simulation models to address these issues.

What we're going to talk about today is some work we're doing to develop the existing model, Paul indicated that work in progress was acceptable(!) and this is very much work in progress! And so we're trying to describe an incremental approach that we use to bring in a new generation of older people into CARESIM.

This is a model that I suppose, I mean it had a chequered history but it's been around at least since 2000 and my whole approach to it has been incremental mainly because people won't give you large amounts of money to develop and maintain models, but they will give you small amounts of money to answer specific questions and in the process of answering those specific questions you can develop and enhance the functionality of the model. And so this is an example of that as well.

So we'll describe the approach, present some preliminary outputs and then discuss some of the limitations and the next steps.

CARESIM as I said is a microsimulation model of long term care charges for older people in the UK. It uses as its base sample the Family Resources Survey and at the moment I'm using a pooling of three of the fairly recent surveys. So we take a representative cross sample of the UK population.

In the base year it simulates income tax liabilities for the whole sample, so that's the whole population, all age groups and it simulates means tested benefits and care charges for the 65+ population. So it embodies standard tax benefit model with the addition of simulating what people would need to pay towards their care should they need it, given a set of rules about how care is charged based on people's incomes and assets.

It also is dynamic in the sense of ageing the sub sample of people who are currently aged 65 and over so in the base year, and that means that you can simulate their taxes and benefits and their liability for care charges in future years. But you're simply ageing the cohort of people who are currently aged 65 and over and not bringing in people to replace them.

Now if you do that what you have is a sample of the general older population, and having simulated what their liability would be for care charges should they need it, you have to take into account well what sort of people do need care? And that we take account of by applying a set of weights which come from a separate model which is, has been constructed and maintained by the Personal Social Services Research Unit at LSE which is a more macro based model, a sort of cell based model. And that tells us the numbers of people in each age, gender group, marital status, household tenure group they think will be receiving different forms of care now and in future years' time. So if you like we're taking a general sample and re-weighting it to make it look more like a sample of people who would receive care.

So if you take the base year which is 65+ the people who receive care are generally older than that sample as a whole, so you re-weight up the people who are aged 85 and over, they're more likely to be single, they are less likely to be owner/occupiers. So you're re-weighting for those sorts of characteristics.

Now the limitation of the model at the moment by not being refreshed, by not bringing in people who are currently under the age of 65 is that if you go for example 20 years hence, then the simulations are only valid for people aged 85 and over, those are people who are currently aged 65 and over, we've aged them in various ways, making assumptions about how their incomes would evolve and so on. So it's only valid for those aged 85 and over. Now for the years that I've been using this model I've defended that on the basis that well people who receive care tend to be the oldest, so being able to make comparisons between now, people aged 85 now and 85 and over in 20 years' time is still informative.

Another limitation is that beyond the base year it's not possible to model any tax revenue raising options which would apply to under 65s because they are not being aged. And it's also not possible to include social security benefits for carers which are arguably part of the care system of older people if the carers themselves are under 65.

Now it's worth saying briefly why it is that until now we've not been trying to include people who are currently aged under the age of 65 and that's because as soon as you go into that realm you are talking about people who are not retired, you have to simulate the build up and accumulation of their pension rights in order to be able to say what kinds of incomes they would have in old age and therefore what their liability would be for care charges. So there was a reason why we hadn't got round to doing it until now.

What we're now doing is trying an incremental approach to addressing some of those limitations and so the first thing that we're doing which we're going to talk about today is to be able to simulate care charges for all those who will be aged 65 and over in up to 20 years from the base year. That also enables us to some extent to extend the time horizon if you buy my argument that focusing on the 85 and over is a legitimate thing to do, still tells you something, then essentially by bringing in people who are currently 45 to 64 we could look 40 years ahead at the 85+ population rather than the 20 years.

Ultimately but not yet we'd like to model the availability of informal carers of sample members who are aged 65 and over in the output year and their entitlement to adult carer social security benefit. So we'd like to bring that in as part of the public expenditure that goes on supporting the care system, and for that we therefore need people who are say the children of people aged 65 and over.

And ultimately but again not yet if we had a full-blown dynamic population model then we could simulate income tax liabilities for the whole adult population for the same time horizon. And of course that's relevant because if we're looking at changes to the care charging system, if we're looking at changes which put more money into the care charging system, we have to think about where that revenue would be raised from, and one option would be from general taxation and from people who are currently under the age of 65.

So this is an illustration of what we're having to do in order to add the new cohort of people who are currently aged 45 to 64. At the moment this is what we do, we start in 2007 with people aged 65 and over and that means that by 2027 we only have people who are aged 85 and over. We are now including people who are as young as 45 in the model, still using the Family Resources Survey because the Family Resources Survey is general population sample, so we can find our people

from that same sample and by ageing them we can get to a full sample of 65 and overs by 2027. But as I said before, in order to age them the big hurdle we have to get over is simulating pensions and retirement because these people have not yet retired, we therefore have to have some way of simulating the accumulation of their pension rights and predicting their likely income in retirement. The orange box there shows you what we're aiming for at the moment to get to the 65 and over population by 2027 but extended beyond there you can see that we could also go up to 2047 if we were going to just restrict the analysis to people aged 85 and over.

What I'm going to do now I think, oh sorry I didn't describe the pension system, I thought we were going, yeah OK, I won't go into detail about the pension system because you'll either know it or not want to know it, but the important thing for the simulation of, the accumulation of pension rights is that the system is heavily dependent on contributions to pensions both state and public that you make during your working life through, from your earnings, so your work history matters. The state system has a system of credits for periods when you are caring, particularly child caring, so that means that we need to consider whether at each point during their working lives people, particularly women have a child who would be attracting a credit for the state pension system even if the women concerned wasn't earning and contributing to the pension system.

There have been a number of recent reforms, at least we think they're going to be implemented, some of them might not be, earnings linking the level of the basic state pension rather than price linking is promised by the end of this Parliament, and various other changes which affect people's means, entitlement to means tested benefits in old age, so these are some of the reasons why we need to take the pension system into account when thinking about what people are liable to pay for their care. And we have so called auto enrolment into new forms of private pensions, the new system of personal accounts.

Now the long term care policy system, right well we have a system which is a mixture of state and private resources. State support is subject to means test which vary between Scotland, England and Wales and are different for residential and care at home. The Royal Commission on Long Term Care which reported in 1998 ish I think recommended that both nursing and personal care should be available without a means test. So called free nursing care was implemented throughout the UK but only free personal care was int, free personal care was only introduced in Scotland and I dare say our next speaker may say a bit more about that. The means tests continue to be a source of discontent. The oneness review of social care in 2006 suggested a new partnership model of paying for long term care and we know that in work leading up to forthcoming green paper, a number of different options have been looked at for social insurance system for example, because I think it was the ILC UK international longevity centre came up with some ideas there. In the budget we were told that the green paper would be in June, we have now recently been told that it will be in July and there is an extremely interesting statement which goes along the lines something like the green paper will show that the system of funding long term care is fair, sustainable and affordable, the minister has made some statement. So who knows what changes may not be afoot!

I will now hand over to Marcello.

Marcello Marciano: Thank you very much Ruth.

So in July 2008 we started the project of adding a new cohort of individuals in the CARESIM sample and this light describes a little bit of the structure of this certain routine which I have constructed in order to add this cohort and obviously to simulate the level of pension earnings.

So first of all from the CARESIM sample we extracted people, about 50,000 individuals who represent people aged between 45 and 64 in the year, FRS, for these individuals you know a wide range of socioeconomic characteristic which is useful for computing pension earnings. However, some other characteristic are not available within the FRS and then we impute them using an external source which is the data from the English ? Study of ?.

The second step is that obviously in order to simulate the future patient we need to construct a working history. The majority of this cohort who belongs to our cohort of interest are has already spent at least half of their life in the job market. So an important point here is to cast back the working history of those individuals, and in doing that we use a procedure which exploited information that has already available within the FRS, which is the number of year that the individual reported to spent in as part time worker or full time worker. And if individual declined to have a past working

career so we simulate back this information and obviously we take in account their condition of credits, mainly because of childcare responsibility which is important for computing the future state pension.

When we finish this part of the model obviously we have to simulate the future and then the completion of the working career for these individuals. Here for example we simulate that the transition from to the labour market are governing from the estimation of ? which exploit 14 ways of BHPS. And obviously for those that are part time or full time we simulate gross earnings which is stochastically determined using gender specific coefficient carrying on a pooling of FRS data.

When we assume at the moment that individuals decide to retire when they reach the state pension age, when they reach the state pension age we simulate deterministically the public pension.

So here we discuss some preliminary results that we have found. If we consider that past trend will be available also for the future, we simulate a sharply decline of the share of women in particular who are inactive or unemployed. This mainly depend of the trend that we observe in the BHPS but it depends also for an increase for example of full time, part time workers between the new cohorts of female and it depends also because, decreasing on the transition from part time or full time status who are inactive or unemployed status. And obviously in the final part of this graph it depends because of the increase in the state pension age.

So looking at the results on the public and private pensions. So first of all we draw the attention on the first part of this series which refer to, observe data from FRS. And this graph show the amount of public and private pension for the new retiree divided by gender. So we look for example first of all that since the base year, here we do not take in account the role of means tested benefit, but we know the gap between male and female. This gap should persist over time but we know that at the end of the simulation the gap is constrained. This mainly depend on the role of the public pension and the reforms that are, that will be applied for the future. So the first part of this graph show the role the public pension and so far the BSP for example, we note a slight increase for both male and female and this is mainly due for the indexation or the earning that is, will be applied from 2012 maybe! The reduction of the number of credited year required to be entitled for the full amount of British Household, BSE which is about 80% of the total public pension. And obviously there is an increase of the earning related state pension and this mainly depends from the shift from ? to the second state pension, in particular for the women for a more favourable consideration of the credit care responsibility credits.

Finally, looking at the preliminary research on the private pension which means ? and occupational pension, we look at that also the level of amount projected for female is sharply increased and this mainly depends not for a change in personal characteristic per se of the female, but mainly because of the increase of the length of time that female will spend on the job market and then the number of year which they contributed for. And obviously for a more favourable situation in the labour market regarding the level of earnings as well.

So all these graphs don't take into account the role the of means tested benefits and in order to know what's assessing the implication or adding the new cohort, the distinguishing analysis on care charge, the next slide which we presented to Ruth looking at that.

Thank you.

OK, so what we wanted to do just very briefly is to think well what does this mean? Having brought in this new cohort of younger generation, does it make much difference to the conclusions that we draw about the distributional effects of some reforms to the care charging system. And to do that we run the, we have to run the new cohort and the existing cohort through the CARESIM model and that does the assessment of entitlement to means tested benefits and then the assessment of liability for care charges and the re-weighting of the population using the PSSRU weights.

So we're going to think about two aspects here. First of all what difference does it make if we now compare the results for the base year in 20 years' time for the 65 population rather than the 85 population. And the second aspect is what happened, we're now, when we do these distribution analysis in the past what we've had to do is look at people in different parts of the income distribution where the income distribution is defined with reference to their own age group, OK. So what that means is that if someone is in the top income quintile, they're in the top income quintile for their age

group, so by 2027 that meant for 85 and over. And being in the top quintile for an 85 year old doesn't necessarily mean you're being, you're very rich. And so this has been the subject of some discussion.

But what we can do now to at least address that to some extent is look at the income distribution at least for the whole 65+ population and see what difference that makes.

And just by way of illustration we're going to look at two reforms that we have run through the model, two potential reforms. One is free personal care, so this is essentially what they've done in Scotland which takes the form of a flat rate, non means tested subsidy to care in a care home, so you get a non means tested subsidy of the care fee. And then for care at home it's free of charge on the assumption that you've been assessed as needing that care.

In a variation on that we have an option which disregards housing wealth because this is, there are two reasons why you might think this is a reasonable thing to do. First of all it's very unpopular that people have to use their housing wealth to pay for care and normally they will have to do so if they don't have somebody, a close relative who needs, continues to need to live in the home. The other is that it creates more of a level playing field with care at home which is not, for which housing wealth cannot be taken into account and the current system with that discrepancy has within it a rather perverse incentive which encourages local authority to put people into care homes because it gets more of the costs paid that way, which is contrary to the general philosophy of keeping people in their own homes.

So this first slide compares the results, what I'm looking at here, on the horizontal axis we're measuring the five income quintiles, so there's a series of bars, so lowest to highest. On the vertical axis we're expressing the average financial gain from this reform received by people in each of these quintiles, compared with the overall average. Because these reforms cost different amounts you need some sort of normalisation. So what that means is a number above 100 means that in that quintile the average gain is greater than the average for the whole sample, a number below 100 means that it's less.

So if you look a the first bar here, the black bar, which is free personal care in 2007, you can see that the largest gain, people who gained the most are those in the highest income group and that's one of the reasons why the Westminster Govt didn't take up that suggestion by the Royal Commission.

If you look at the blue bar, hat's the same thing 2007 but now looking at this idea of disregarding the housing wealth where the gains are more concentrated in the middle of the income distribution.

And in the next two sets are for 2027 and one thing they show is that it changes quite a bit over time, and this is particularly the difference between free personal care and the housing disregard which is partly to do with the continued spread of owner occupation amongst older people and the fact that that is spreading more to people on lower incomes. So disregarding that housing wealth actually is better for low income people in the future than it is now.

The question then is do you get a very different story if you extend this from comparing the 85 population to the 65+ population? And the picture changes a bit, but I think the central message of the comparative distributional effects of those two reforms is not changed very much. Now I can't decide whether I'm pleased or not about that because there's a lot of work gone in to do that! On the other hand I've been saying for years it doesn't matter!

This is looking at, making a comparison between whether you use the age specific income distribution, the age group specific income distribution, so here people are rich if they are rich for their age group, or if you use the total 65+ population. And again the story is not particularly different, and again I don't know whether I'm pleased about that or not! But it gives you an indication, at least to some extent this question always comes up when we use the age group specific one, so it's quite nice to be able to say it doesn't seem to make a huge amount of difference.

So to conclude, I'm sorry we're sorry going on a bit. It seems thus far that when we have restricted the analysis to those over 85 and over it is not as limiting a it may seem at first. However this is very early days, we need to do much more validation and sensitivity analysis and we need to extent the range of events that are simulated for the new cohort. For example we don't simulate divorce and remarriage, when you're talking about ageing the 65+ population, that's kind of defensible, when you're talking about the 45+ population it's less defensible. And some of our next steps apart from doing much more work on what we've done already is to extend the time horizon and extend the young, the cohorts that we bring in still further.

QUESTIONS

Male question 1 – What does happen to the income distribution between, as you move it forward? Is the income distribution staying the same?

Ruth Hancock – That's a question I haven't asked myself, just I mean just looking at yeah, yeah, that's a good, I don't know but worth looking at. I mean we've sort of here gone straight to the final answers and not done some of the, what we need to do is look much more at the intermediate output and see what it's telling us.

Male question 2 –On your last sort of chart, the yellow bars seem to be going…

Ruth Hancock – Yeah there is, the next one?

Male question 2 – … down from left to right and then…

Ruth Hancock – So you mean this going down there, there is more different yeah, going up then going down a bit at the end yes.

Male question 2 – What's the difference between these? What do these represent? This is differences in the way you've measured …?

Ruth Hancock – This is the way we've classified people's income, so these are people who are rich for their age group, in 5 year age groups within the 65+ population, and these are people who are 65 and over and they are rich for 65 and overs. So you would get, here you would have more younger people I would guess up in the top of the income distribution and more, so the income distribution is, there'll be a different composition of the age groups within those income groups. So that might affect, that would, because it will certainly affect the kind of care that they're receiving, you would have more people in the younger age groups receiving home care rather than residential care because this combines the two. But thanks for pointing that out because it's the sort of thing we need to look at more closely.

Male question 3 – Are they centralised or are they specific to local authorities?

Ruth Hancock – No it's not, the residential care charging system is centralised, well it's a national guidance system and the local authorities have limited freedom to vary it, there are some variations between England, Wales and, well Scotland are different but you have England and Wales in some of the capital limits, but broadly speaking it's centralised. Across local authorities they have much more freedom, and what we have done here is to adopt a sort of stylised version of the home care charging system, so we are not reflecting that variation across local authorities. That would be something which would be interesting to do and it's an obvious way in which some kind of, certain national analysis would be very interesting. There are broad parameters that they have to work within and what we've done is have a stylised system which meets those broad parameters but we do know there's a lot of variation within them.

Male question 4 – The Govt's certainly very keen on having some indicator of inequality of all this obviously does income but there are range of other inequalities as well that might be possible? Is it possible to look at, which other dimensional qualities can this sort of analysis throw light on?

Ruth Hancock – Well I suppose there are a number of things. I mean you could look at income inequality in a different way, I mean this is a snapshot, you could look at, within CARESIM you could look at lifetime income but you could look at life after 65 and one of the reasons for some of the change we want to do is to have that more lifetime perspective in. Of course what the interesting thing to do would be to have some measure of, if you thought that receiving care, given people's ? disability affected their wellbeing, their happiness even, then you could have some relationship there and build in some measure of sort of health or mental wellbeing and combine that with income. And that's something I would like to do, or look at healthy life expectancy by income group, that would be something that would be nice to do.

Male question 4 – Yeah and particularly there's an interaction between how long you live and how wealthy you are and of course that also will to some extent interact with how much care you get and therefore the benefits you get from the care system and can you unpick that second part of the causal chain?

Ruth Hancock – If somebody else can unpick it, we can feed it in! LAUGHS Or even if we could unpick, but it's not kind of intrinsic to the model.

Male Question 5 – Picking up on that point, how would all the stuff from Mike's model on kinship be available to provide to care feed into …?

Ruth Hancock – OK, I mean at the moment it's not but this is something that we've talked about a lot actually because we, within, in order to do the credits for pensions, we at the moment impute from ELSA the number of children living outside the household so that we can at any point in people's past work out how many living children they had. The alternative to that would be to use the outputs form Mike's model and probably – ELSA gives us more characteristics to vary it on but I suspect Mike's totals are more accurate!

Male Question 5 – Align the two together and then …

Ruth Hancock – Yeah.

[END OF RECORDING]