Demographic projections: who needs to know?

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Abstract

The uses to which demographic projections are put was the subject of parallel postal surveys in the United Kingdom and Australia. Around half the organisations approached sent in replies, from private and non-profit sectors as well as public. The survey reveals widespread and growing interest in demographic prospects, particularly strong in the Health Service and Local Government. Only a minority of users looked very far into the next century. While customers are on the whole satisfied with official projections, the need for better local projections was a recurrent theme in both countries. Information on internal migration, and variant assumptions about its course were in strong demand, as were better and more up-to-date baseline data on the present. Improved methodology for local projections and training in it is called for.

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Population projections, long a part of the demographer's repertoire, are probably the most important tool of applied demographers. In recent years there has been an increasing awareness of the need to take 'demographics' into account when making and implementing policy throughout the public and private sectors. This has led to an increase in the number of individuals using demographic techniques, and making use of projections.

Informed policy making requires accurate scientific information. The need to minimise errors in projections has led to an increasing sophistication in projection methodology. A projection is only as good as the assumptions on which it is based. Some of the major developments have related to the estimation of future trends in fertility, mortality and migration. Most national and regional projections typically use a component approach to account for different assumptions regarding future demographic trends. In the main, national projections tend to be reasonably accurate in the short term but fluctuations - particularly relating to fertility - in the underlying demographic phenomena can lead to substantial errors in the long term. For example, estimates of the population of the United Kingdom in 2000 based on age-specific fertility at five-year intervals between 1955 and 1980 vary by a total of 30 million.[1]

Problems are compounded at a local level where migration plays an important role and where associated planning decisions such as new housing developments can have a profound influence on the future population. As a result, various strategies have been proposed for projections of small areas. These include enhanced electoral rolls and techniques for accounting for potential housing developments. Again though, they lead to fairly accurate short-term projections but the error may be compounded in the long term.

The purpose of our report is to look into who uses which demographic projections for what purpose. To this end we conducted surveys in both the United Kingdom and Australia. The survey in the United Kingdom was concerned primarily with officially published projections of the population, the labour force, and households, along with demographic and derived projections from a number of other sources. The survey in Australia focused specifically on population projections. In both countries, more or less similar questions were asked of ad hoc samples of potential users, with strikingly similar results. This paper gives a detailed account of the British results, and an overview of those from Australia. A full report on the Australian survey is given in a paper by Diamond, Tesfaghiorghis and Joshi, 1990: 'The Uses and Users of Population Projections in Australia', Department of Demography, ANU.

[1] Pollard AH, Yussuf F and Pollard DN, *Demographic Techniques*, 3rd Edition. Oxford: Pergamon (1990)

1 Who uses projections?

Who did we ask?

In order to find out about the uses of demographic projections we contacted a number of organisations which we thought did or might use them. This is not a well defined universe, and, in the United Kingdom, we did not have a frame from which to draw a random sample. Our sampling procedure was a mixture of the quota and the snowball. The result is not strictly a random sample from which standard statistical inferences can be drawn.

Our initial lists of contacts came from the official liaison group in which central government departments and some other official bodies discuss the making of projections with OPCS; a sample of one in two county-level local authorities in which the chief executive's planning and education departments were contacted.

Health authorities were contacted through regional statisticians, some of whom passed the questionnaire on to their districts. By the time the computer file was finalised there were 32 returns from health districts. Twenty-six more came in during the writing of the report, and it was possible to incorporate some of their verbal comments.

Further lists of addresses were selected from the BSPS membership, people who had attended relevant courses at Birkbeck College and Manchester Business School, directories of planning and other consultants, and the sample was boosted with addresses of larger voluntary organisations, trade unions and private companies.

In Australia there was a better sampling frame in the form of the membership list of the Australian Population Association, which was boosted by approaching all member companies of the Market Research Society and selected companies.

Who replied?

In the United Kingdom we sent out over 500 questionnaires in mid-March 1990 and ended up with 278 to analyse at the end of April. The number of non-responders was also 278. This does not mean we actually had a response rate of 50 per cent; because of the snowball nature of part of the sample, 32 forms came back from health districts which we had only indirectly sampled. We do not know how many other health districts had been contacted by their regions. Excluding the health districts the overall response rate was 47 per cent. This is higher than was expected of a rushed postal survey,[2] with no time for sending out reminders, but perhaps not so surprising when considering that many of the people to whom the enquiry was addressed are themselves professional statisticians or data

[2] NEDO's postal survey of 5,000 firms received less than 2,000 replies. *Defusing the Demographic Time Bomb*. London: NEDO (1989)

gatherers, at least in the public sector. Response in Australia was very nearly the same. The achieved sample of 166 out of 345 forms sent out represents 48 per cent response.

Table 1 Response to United Kingdom survey by sector

Sector	Number contacted	Number not responding	Number responding	Response rate %
Public sector	277	128	149	53.8
Central government	39	19	20	51.3
Local government				
planners	60	16	44	73.3
others	60	45	15	25.0
Education authorities	54	39	15	27.8
Health authorities				
regions	19	2	17	89.5
districts	-	-	32	n.a.
Other public sector	13	7	6	46.2
Private sector	198	114	84	42.4
Consultancy/ market research	40	23	17	42.5
Private firms:				
production	54	33	21	38.9
financial/insurance	35	22	13	37.1
Other services	39	18	21	53.8
Others	81	36	45	55.6
Academics/research institutes	67	29	38	56.7
Voluntary organisations	14	7	7	50.0
Trades unions	30	18	12	40.0
Total	556	278	278	46.9*

* *Excluding health districts*

There are particularly high response rates from regional health authorities (90 per cent) and the planning departments of local authorities (73 per cent). The latter counterbalance the low response from their chief executives' departments (25 per cent). Education authorities are also under-represented (28 per cent) partly because there was no response from any of the Inner London boroughs approached. The Inner London Education Authority was in the process of handing over to the boroughs at the time of the survey. As a whole, organisations outside the government and academe had below-average rates of response, but over half of the companies contacted in service industries other than financial sent back a response.

The resulting sample of 278 consists of 54 per cent from the public sector, 30 per cent in the private sector, and 16 per cent from universities, research institutes and voluntary organizations. The sectoral profile of non-respondents is not so very different: 46 per cent public, 41 per cent private and 13 per cent non-profit making. Among public sector replies, there are strong contingents from local government (59 replies) and health authorities (49). In the private sector there are another 55 replies, categorised below as private firms, consisting of 21 each from production and other services, with 13 from the financial sector. The six responses from public corporations and quangos are henceforth analysed jointly with the seven from the voluntary sector and 12 from trade unions as the miscellaneous 'other sectors'.

Who did not reply?

It may also be instructive to note the non-respondents. This may give an idea of who does not use projections, although, as was actually established by the telephone follow-up in Australia, this is not the only explanation of forms not being returned. The low rates of response by consultants and market research firms, production and financial firms could suggest that demographic projections are not as heavily used in these sectors as in, say, regional health authorities. On the other hand, these were sectors where we were less likely to have named an individual on the letter covering the United Kingdom questionnaire. This must also have adversely affected response.

Who does not use projections?

Before proceeding to the users, the responses tell us a bit more about non-use, for some respondents returned forms, as bidden, telling us that they did not use projections. Of the 15 United Kingdom cases, 8 were firms. Some said this was because they did not deal directly with the retail market: a manufacturer of capital goods, one of chemicals, and a firm concerned with marine insurance. A leading insurance company gave their reasons for not using demographic projections:

> *Our marketing efforts are driven by legislative and local changes and by short-term trends, not by long-term demographic movements.*

Since this company provides life cover among its services this answer is a little surprising, but the idea that a short time horizon makes demographic considerations irrelevant is common. An academic specialist on short-term forecasting also declared himself a non-user, as did two academic historians, and two civil servants whose particular jobs did not involve the use of projections. Another historian, who does in fact use some projections, remarked that the history of projections themselves suggested great care should be exercised in their use.

2 How relevant are demographic projections?

Among respondents we also have the answers on the degree of relevance of demographic projections to their work. A five-point scale ranged from nil to central relevance. Overall, 9 responses (3 per cent) said that the relevance of projections to their work was nil, 6 per cent that it was only potential, 24 per cent that it was minor, 43 per cent that it was major, and 23 per cent that their relevance was central. Nil relevance and non-use largely coincided, potential and minor relevance were over-represented in the private sector, and the public sector over-represented among those reporting major and central relevance. The sector most likely (48 per cent) to say that projections were of central importance was local government, followed by health and education authorities. There was a weak tendency for those who placed a high relevance on projections to have a longer term planning horizon. Of 63

responses of maximum relevance, 8 per cent came from respondents with a time horizon under 10 years and 37 per cent 20 years or more. Compare this with the 58 cases reporting minor relevance, of whom 24 per cent had a time horizon of under 10 years, and 33 per cent 20 years or more.

Table 2 The relevance of projections to United Kingdom users and analysis by time horizon

Relevance	Distribution of all responses on relevance	Time period over which projections used: Years ahead				*Sample numbers (= 100%)*
		1-4	5-9	10-19	20+	
	%					
Central	23	% 3	5	56	37	*63*
Major	43	% 3	11	54	33	*117*
Minor	24	% 5	19	43	33	*58*
Potential	6	% 10	30	40	20	*10*
Nil	3		*(1)*			*1*
All	*273* (a)	% 4	13	51	33	*252* (b)

a. *Base for percents in column 1 excludes 5 cases not answering question on relevance.*
b. *Base for percents in bottom row excludes 26 cases not answering question on time horizon. Base numbers for upper rows exclude cases not answering either question.*

A director of public health rated the relevance of projections as 'minor, but we need to avoid major health service planning cockups!'. Another, more typically, explained why relevance was rated central:

> *Health authority funding is now almost totally dependent on population forecasts, thus the need for good forecasts will be increasingly paramount as the quality of forecasting becomes a 'political' issue between districts and the RHA.* (Wessex Regional Health Authority)

Another account of relevance increasing came from the training manager of a breakfast cereal manufacturer:

> *Demographic statistics are increasingly of importance to us; not the least of which is to aid us in our rethinking on our 'internal' demography.*

3 What projections are they using?

The United Kingdom survey asked which of the officially published projections were consulted: national and regional population projections, labour force and household projections. It also asked about OPCS/DoE subregional projections, which were distinguished at the coding stage between those for health districts and those following local authority (metropolitan district and shire county) boundaries. It also asked if respondents made their own projections, used others, or used none at all. More than one answer could be given, and usually was. Table 3 summarises results for the United Kingdom and Australia, showing a similar pattern in both surveys.

Table 3 Distribution of respondents by types of projections consulted

Types of projections	Percentage of respondents consulting each type of projection
United Kingdom	
National population	77.0
Regional	65.8
Sub-regional*	66.2
Household	51.1
Labour Force	53.6
Own	34.2
Other	24.8
None	5.4
Sample numbers	*278*
Australia	
National population	68.7
State population	75.3
Sub-state population	56.6
Annual population forecasts	43.4
DILGEA forecasts†	26.5
Own	33.1
Other	27.1
None	4.8
Sample numbers	*166*

* *(of which 17.3 use health districts)*
† *Department of Immigration, Local Government and Ethnic Affairs.*

In both countries national population projections were cited most frequently, in the United Kingdom by 81 per cent of those who used any. The sector using them least was the education authorities (47 per cent), who largely used their own projections and those of the Department of Education and Science (not formally published and therefore not specifically distinguished in the question). Regional projections were the next most frequently cited, by 70 per cent overall, and by 80 per cent or more amongst health authorities and the market research and consultant sector.

The two published derived projections, of the labour force and of households, were the next two most popular types cited by just over half of all users, the labour force 149 and household 142. Health and education authorities were not often interested in either of these types of projection, whereas local government, market research and other consultants were particularly likely to be interested in them both. However, these uses did not entirely coincide. Firms, unions and central government responses mentioned labour force projections more often than household, and academics and research institutes mentioned household projections more often than labour force. None the less, each of these projections has fairly widespread usage.

One county council sent a comment about unpublished household projections:

> *DoE published household projections are minimal in content and less than useful to individual planning authorities. Our use is for the detailed unpublished projections of headship rates for our county and England and Wales.*

Subregional projections are heavily used by local government (86 per cent), market researchers and consultancies (77 per cent), education authorities (67 per cent) and private firms (60 per cent). All of the health authorities mentioned subregional projections, presumably of health district boundaries. Two other users, in academe and consultancy, also specified health districts on their forms. Over one third of users (36 per cent) made their own projections, usually in addition to using official ones. The largest number (45) was in local government and the highest percentage among the education authorities, but there was also some making of own projections across the board, elsewhere in government, the private sector (notably consultants) and academe. The types of projections being made were, on the one hand, basic demographic projections at a local level, or, on the other hand, derived projections of particular types of people. The education officers' school roll forecasts combine both these features. More about the responses from those making their own projections is reported in section 6 below.

Amongst those mentioning and specifying 'other' projections a number (10 per cent) were picking up the projections made by local authorities and 7 per cent those made by consultants or academics. A few others specified projections with different geographical boundaries than standard, or of particular sorts of people. An example of both would be the Welsh Boundary Commission's interest in projections of the population eligible to vote in electoral constituencies. Conspicuous by its virtual absence in answers to this question was the rest of the world. Only five mentioned projections published by international organizations such as OECD, IMF or the World Bank.

As we thought that private firms might have interests in more than one country, other countries were also mentioned in a question on the geographical coverage of projections. Seventeen per cent looked at projections for at least one other country, 16 per cent at European countries, 5 per cent North America, and 4 per cent at others. Australia was only of interest to the five British users who mentioned OECD countries. Users interested in projections for foreign countries came predominantly from the private sector, academe or central government. A larger minority of users in Australia, 38 per cent, particularly academics, looked at projections on other countries.

In the United Kingdom, it is a moot point what geographical area is meant by 'the country'. As shown in Table 4, the combined countries of England and Wales, for which much of Whitehall's, and indeed OPCS's, responsibility lies, was the national boundary mentioned most frequently by the users (57 per cent of answers), though most mentioned more than one national definition. Projections for the smaller constituent countries (Scotland, Wales and Northern Ireland) were used by 100 per cent of the respondents from each country and were each mentioned also by a minority of respondents from the other countries. Great Britain, England and the United Kingdom were also mentioned by around 45 per cent of respondents. We

Table 4 National Projections within United Kingdom: Countries covered in projections used by country of location

National boundaries covered	Located in England	Scotland	Wales	N Ireland	United Kingdom
	Percentages in each location				
England	48	13	7	25	44
Scotland	18	100	7	75	24
Wales	19	13	100	75	24
N Ireland	13	-	7	100	13
England and Wales	59	13	71	50	57
Great Britain	47	44	43	50	46
United Kingdom	44	44	36	50	44
Sample numbers	*215*	*16*	*14*	*4*	*249*

were reminded by a health district in north-west England that some also have interest in the Isle of Man. There was a tendency for academics and firms to be more interested in the higher levels of aggregation, like the United Kingdom or Great Britain, and for public sector users to be more concerned with the constituent countries.

What is their time horizon?

In answer to the question on their time horizon, the United Kingdom users gave 10, 20, and 15 years most frequently, with the range 10 to 19 (effectively 10-16) years covering half the valid responses. Amongst those with longer time horizons, 20 years or more, the academics and research institutes were over-represented by a long chalk, though there were also some respondents with this perspective from central and local government. Very few survey respondents reported a planning horizon under 5 years (many of those that do have probably not responded to the survey for just that reason). The private sector was over-represented among those looking 5-9 years ahead. Private sector respondents did not, however, emerge as having markedly shorter planning horizons than government organisations. Several respondents pointed out that they had different planning horizons for different purposes. The Treasury, for example, said that macroeconomic forecasting and policy making looked up to 10 years ahead; on microeconomic issues concerned with industry, housing and

Table 5 Time horizon of United Kingdom users by sector

Sector		Years planned ahead 1-4	5-9	10-19	20 or more	*Sample numbers (=100%)*
Central government	%	6	11	44	39	*18*
Local government	%	2	5	60	33	*58*
Education authority	%	14	21	57	7	*14*
Health authority	%	-	8	69	23	*48*
Academic/ Research institution	%	3	-	18	79	*34*
Consultancy/ market research	%	7	20	33	40	*15*
Private firms	%	5	23	51	21	*43*
Other	%	5	32	50	14	*22*
All answering	%	4	13	51	33	*252*

employment, the perspective goes up to 20 years; and for long-term public expenditure planning, 50 or 60 years. The longest horizon, 70 years, was reported by the Government Actuary's Department for pension planning.

The 1987-based national population projections (published in OPCS Series PP2) run 70 years to 2057, but the subregional projections extend only 15 years ahead. The household projections run from 1985 to 2001, and the Labour Force Outlook published in 1989 extends to 2000.

Table 6 Percentage of users in United Kingdom and Australia saying that official projections covered their time period, by sector

Sector	United Kingdom		Australia	
		n		*n*
Central government/ Commonwealth	94 %	*17*	79 %	*24*
Local government/ state government	93 %	*56*	82 %	*60*
Education authority	82 %	*11*	-	-
Health authority	91 %	*46*	-	-
Academic	91 %	*32*	71 %	*34*
Consultancy market research	93 %	*14*	70 %	*23*
Private firms	88 %	*43*	64 %	*25*
Other	91 %	*22*	- %	-
All	91 %	*241*	75 %	*166*

We asked users whether official projections covered their time period. Table 6 summarises responses in both countries. In Australia, 75 per cent of valid responses were positive, but the majority (79 per cent) in the United Kingdom were more decisive. A few British responses were qualified.

> *Yes, except household and labour force projections* (Dorset Strategic Planning Authority)

The idea of partial adequacy also cropped up:

> *Yes, but I usually have to calculate intervening years, e.g. for 1994 (only 1993 and 1996 available).* (A senior market research analyst)

Although the complete run of years is, in fact, now published on microfiche, a similar reason for a negative response was given by a forecaster in a real estate consultancy. This helps account for the otherwise puzzling feature that it was not only users with long time horizons who said that official projections did not cover their time period. In the short run, problems of current estimates being out-of-date and the periodicity of projections also present difficulties.

4 Why do they use them?

The recent upsurge in interest in demographic prospects has been connected with the falling numbers of young adults, and therefore labour force entrants in Britain. NEDO's survey of employers in 1989 found growing, though imperfect, awareness of demographic prospects. Although nearly two thirds 'correctly expected a significant decrease in the young labour force, only one fifth correctly anticipated an expansion in the labour force' (op. cit. in note 2). In this context it was of particular interest to see how far our respondents were consulting projections for purposes connected with employment - recruitment, personnel management and training. Expectations were confirmed in that this reason was given by a majority (60 per cent) of British firms, and almost as many (58 per cent) of the 'Other' sector, which includes unions, public corporations and voluntary organizations. Overall, one in three mentioned this reason. This is quite a contrast with Australia, where only 8 per cent of all users mentioned recruitment and personnel as reasons for using projections, and where private firms are not any more interested than average. Australia is not facing such an abrupt age-structure change as Britain's 'Time Bomb', but the contrast may be exaggerated by the explicit inclusion of labour force projections as subjects of the United Kingdom survey.

Tables 7 and 8 summarise the reasons reported for using projections by the United Kingdom and Australian surveys respectively. Four fifths of respondents gave more than one answer to the question of what were their 'main' reasons for using projections. The response given most frequently in both countries was 'research' (76 per cent United Kingdom, 51 per cent Australia), though this turned out to be a very generalized use, spread across all sectors, not just academics (94 per cent and 79 per cent in the respective countries). In both countries the incidence of research as a reason for using projections is relatively low in private firms. 'Planning' was another general and frequent response to the unpiloted questionnaire. It had been intended to signify the spatial planning carried out in local government, where responses almost universally cite this use. 'Teaching' had been included on the questionnaire with academic respondents in mind, but we also had this answer from other sectors. These referred to internal training and external dissemination activities, particularly in local government and health authorities.

'Marketing' is a reason given by about half the private sector respondents in both countries, location the next most frequent, followed by investment. These last two reasons also occur among public sector responses, where the various sorts of service provision, transport to welfare, are more important. Implicit in a lot of the public use is the role played by demographic projections in resource allocation. This theme emerged among the other reasons specified, along with policy advice, labour market analysis, planning leisure services, economic forecasting, making derived projections ... and planning surveys.

Comments on why projections used, by sector

The following extracts from United Kingdom questionnaires, listed by sector, give another perspective on the diversity of the uses to which demographic projections are put.

Table 7 Reasons for using projections in United Kingdom, by sector

Main reasons for using projections	Central government	Local government	Education authority	Health authority	Academic Research	Consult market research	Private firms	Other	All
				Percentage in each sector citing various uses					
Recruitment and personnel	33	22	13	33	6	18	60	58	32
Marketing	11	14	-	6	9	47	52	17	20
Investment	17	15	-	10	6	24	31	8	15
Location	11	19	13	27	-	41	38	13	21
Transport	28	63	13	2	-	53	6	8	22
Planning	56	97	13	59	-	65	2	4	42
Housing	28	78	-	4	9	41	10	8	26
Education	22	73	100	-	11	18	10	13	29
Welfare:									
general/health	28	71	-	100	20	18	4	21	43
elderly	39	75	-	41	26	6	4	17	33
children	33	75	7	41	14	12	2	17	31
Research	39	54	20	51	94	53	21	67	51
Teaching	6	10	20	14	46	6	2	17	15
Other uses	44	31	27	20	14	29	8	38	24
Sample numbers	*18*	*59*	*15*	*49*	*35*	*17*	*48*	*24*	*265*

Number giving no answer =13.

Table 8 Reasons for using projections in Australia, by sector

Main reasons for using projections	Commonwealth	State	Academic	Market research	Private firms	All
		Percentage in each sector citing various uses				
Recruitment and personnel	8	10	3	13	8	8
Marketing	8	5	6	48	60	20
Investment policy	4	3	6	22	20	9
Location of industry	8	13	9	35	24	16
Planning:						
transport	4	18	12	4	24	14
housing	13	30	18	13	32	23
education	8	30	44	9	24	26
Welfare:						
general	21	37	24	17	24	27
elderly	25	32	29	17	16	26
children	21	23	21	13	16	20
Research	42	47	79	44	36	51
Teaching	4	18	59	4	12	22
Other	29	43	18	9	24	28
Sample numbers	*24*	*60*	*34*	*23*	*25*	*166*

Central government

The Department of the Environment has many different uses for projections:

> *Population and household projections usefully inform discussion about the future of provision of housing and the plans that local government prepare for future local development. One specific use for population and marital status projections is as an input to household projections. The main areas where projections are used is in housing, planning and research activities.*

Local government finance, the Revenue Support Grant and the Community Charge, is not a big use for projections as the time horizon is short - up to two years. This section of the department has a need for up-to-date current population estimates and for short-term population forecasts at the shire district level ('compiled on a nationally consistent basis'), and hopes that OPCS will continue its current experiment with short-term extrapolations.

HM Treasury listed among its uses of projections the assessment of macroeconomic and long-term public expenditure implications of demographic change, and labour market policy. The Department of Employment is also concerned with labour market policy and uses the OPCS projections to make labour force projections. The Department of Transport consults demographic projections in the long-term planning of roads and other transport investments.

The use of projections for pension purposes is done for the Department of Social Security by the Government Actuary's Department. Short-term and means-tested social security benefits are forecast only a few years ahead, and are more

sensitive to economic change, for example to employment rather than to demographic factors.

The Department of Health summarised:

> *The use of projections is implicit in any publication, report or answer to parliamentary questions which relates to resource allocation for the health service and to future demand for health services and community care.*

One Home Office statistician reported:

> *We find the national (England and Wales) age-specific projections from OPCS invaluable as a basis for projecting future changes in numbers in the early stages of the criminal justice system - crime rates vary substantially by age and sex.*

The writ of Whitehall does not always cover the whole of the United Kingdom. Central government offices outside England sent responses reflecting the full range of uses.

The Scottish Office:

> *We are heavy users of demographic projections. Our typical use is to combine projections with other information we collect ourselves, and thus to produce derived projections of specific groups (households, school pupils, etc).*

The Welsh Office said that outside users of their population projections at county level include information marketing companies, other government departments, various consultancy firms, major public utility services, police, DHAs, charities, and academic researchers.

Local government

Some idea of the multiplicity of use in local government may be gauged from this extract of the reply from the Essex County Planning Department:

> *The Department acts as a source of information and advice on demographic issues to a wide range of users. Advice is particularly sought on demographic projections and their relationship to planning policies. The service is provided to other county council departments and also to district health authorities, statutory undertakings, research bodies, developers and their consultants, other private sector businesses and individuals.*

Health authorities

A respondent in a regional health authority explains:

> *Health services are very age-related, so changes in the age breakdown of the population are very important - especially for the elderly. The main use is strategic planning of health services.*

Health districts generally replied that they used projections to assess health care needs, to plan health services and to monitor public health. Specific examples came from another regional health authority:

> *Bed requirements for hospitals; numbers of long-staying psychiatric residents.*

Another respondent from a London district mentions:

> *future staffing, health visitors, midwives and services for the elderly.*

Academic and research, and voluntary organisations

A lecturer in social policy:

> *National projections especially are a vital part of a teaching programme on provision of services for the elderly, future education policy, etc. They are also used in relation to any papers I may write on future policy developments.*

A professor:

> *My work is concerned with projections for Catholic and Protestant populations of N Ireland involving indirect estimation of mortality and fertility schedules - vital statistics on N Ireland are not disaggregated by religion.*

The National Institute of Social Work expressed an interest in the household composition of the elderly by locality, in the context of planning home care. The Methodist Church use national, regional and subregional projections for the purposes of 'the deployment of clergy'.

Smaller charities are expected to play an increasing role in the care of the elderly, on precarious budgets.

> *Forward planning of care needs accurate and detailed projections, which small organizations cannot make for themselves. Some make use of material which comes to hand, however inappropriate, others are unaware of the basic projections available.* (An academic consultant)

Private sector

The policy/economics section of a consultancy working mainly for central and local government reports a wide use:

> *Projections on households and labour force have been used in reports to assess housing strategy, economic development needs and other issues connected with future assessment of consumption, employment and traffic patterns.*

The Henley Forecasting Centre says a number of their client project reports quote demographic data and projections.

Table 9 Features of interest in projections, United Kingdom and Australia

Percentage of mentioning	All users	Sectors mentioning markedly more often	Sectors mentioning markedly less often
United Kingdom			
	%		
Age composition	98	uniformly high	
Sex composition	89	Most sectors high	Firms (66)
Social class/economic group	74	Health authorities, market research	Education auths, central govt
Ethnic group	64	Health & 'others'	Firms, central govt
Family type/ household composition	53	Local govt, health, academics	Central govt, firms, education
Marital status	50	Local govt, central govt, academics, market research	Firms, education, 'others' Firms
Urban/rural residence	42	Health & market research	
Others	23		
Sample numbers	*262*		
Australia			
	%		
Age groups	80	uniformly high	
Single year of age	42	States	Private sector
Sex composition	72	States & academics	Private sector
Social class/economic group	63	States & market research	Academics
Ethnicity	61	academics	Market research & private sector
Family	51	uniform	
Urban/rural residence	54	Commonwealth & states	Market research & private sector
Working age	54	Market research	Academics
Voting population	15	uniformly low	
Others	24		
Sample numbers	*166*		

A manufacturer of office furniture and travel goods (whose own time horizon is not stated) writes:

> *Demographic projections are of great value for market trends and other commercial judgements. However we do not make a formal study of any projections - it's more a question of being aware of overall trends. The problem is the error in projecting forward too far.*

A brewery forecasting manager,

> *An ageing population changes its pattern of consumption of drinking and eating, in terms of where, when, how much, how often.*

A market analyst, who also referred to the age-specificity of the market for many consumer goods, gave another example of the market for convenience food being affected by the number of one-person households. RTZ Ltd, working on future trends in metals and minerals markets, found population projections for each OECD country very useful in pointing out broad trends over the next 10-20 years.

Trades unions

The Engineers and Managers Association makes intermittent use of demographic projections for populations, age structures, and the labour force. They cite recent work on the shortage of engineers and technicians.

The Institute of Professionals, Managers and Specialists:

> *Our needs are for simple, basic statistics and projections on employment and educational or training levels. We use it as background or contextual information in policy and briefing papers on recruitment and retention, training needs, women into science and engineering, etc.*

Two unions representing staff in higher education sent responses telling of their use of demographic and derived projections in the campaign to defend the sector and increase access to it.

Our respondents provided further evidence of the wide range of uses to which demographic projections are put, in listing their publications. A bibliography compiled from the responses to the two surveys is appended.

The survey of projection use had among its objectives the identification of gaps in use. This of course is not easy to establish, but the survey has found a great variety of use in a wide range of organizations. Clearly no one use is universally adopted, and there is widespread non-use as well alongside widespread use. There is still a lot of room for the application of demographic projections to increase.

Features used or desired

Respondents were asked about a number of actual and potential features in projections. These are summarized for both countries in Table 9.

Age composition was of interest or use to all users. Single year of age was specified in the Australian form, and indicated by about half as many users as indicated age groups. The demand for other common features ranked similarly in both surveys, along with the sectoral pattern of interest. Private sector users were, on the whole, less interested in additional features than the public sector.

Table 10 How frequently are projections used? Percentages in each United Kingdom sector

		Monthly or more	1-3 months	over 3 months under 1 year	Once a year	Sample numbers (= 100%)
Central government	%	59	18	6	18	*17*
Local government	%	61	28	6	6	*54*
Education authority	%	27	36	36	-	*11*
Health authority	%	36	33	17	14	*42*
Academic/research	%	13	33	23	30	*30*
Consultancy/ market research	%	62	15	23	-	*13*
Private firms	%	14	19	42	25	*36*
Other	%	10	43	19	29	*21*
All	%	36	29	20	16	*224*

Number of missing observations = 54.

Social class or economic group was among the features listed, though not currently part of published projections. A higher education trade union gave an example of a use for projections by social class: they would like to see a projection of the total fall in the numbers of 18-21 year olds by social class and the propensity to go on to higher education. As is well known, an unadjusted downward demographic trend of the age group is now accepted as giving a misleading picture of the prospective demand for higher education.

A great range of other possible features were mentioned: skills and qualifications (unions, firms, and some central government), durable ownership, especially car ownership, indicators of deprivation (said to be of increasing relevance to resource allocation by a regional health statistician), local authorities and health districts mentioned disability and morbidity, and households likely to be in need of services such as elderly living alone and single parents. Among a number of other different responses were cohabitation, institutional population, language spoken in Wales, and religion in Northern Ireland.

There were comments that the socio-economic features listed in this question would be of interest if they could be reliably forecast, which was doubted.

5 How often are projections consulted and updated?

When asked how frequently users need to update their projections, more than half (62 per cent) of those who answered said annually. Among those with planning horizons of 20 or more years, annual updating was less common (26 per cent). When considered by type of user, annual updating was particularly common (85 per cent) among education authorities.

> *Harrow's school age population is changing rapidly so forward planning requires frequent updating.* (Harrow Education Authority)

The frequency of updating may not, of course, be fixed, and may be constrained by the availability of information and resources, as we were told by Wessex Regional Health Authority:

> *We no longer intend to revise our projections until the results of the 1991 Census are available because a) we do not have staff to do it, and b) the base-line is insufficiently certain for the exercise to be of any value.*

The national population projections in the UK are published on a biennial cycle. They normally appear in the second year following the year on which they are based. 1985-based projections were published in 1987, 1987-based in 1989, and so on. The subregional projections had followed the same two-year cycle, until the most recent round which is based on 1988 rather than 1987. Australian national projections are updated around every three years.

Are official projections sufficiently frequent?

The responses to this question in the United Kingdom and Australia are summarised in Table 11. On the whole, the majority of users were not complaining about the frequency of official projections. In Australia the satisfied majority was slightly smaller (66 per cent) than in the United Kingdom (78 per cent). This probably reflects the fact that projections are produced less frequently in Australia. Among the United Kingdom users whose 'yes' was qualified were officers of Calderdale Metropolitan Borough Council and Berkshire and Cornwall County Councils:

> *Yes, if kept to two-yearly* (noting the delay on the most recent set of subregional projections).

Table 11 Are official projections sufficiently frequent? Percentages answering positively in United Kingdom and Australia

	United Kingdom		Australia	
		n		*n*
All	77.6 %	*228*	66.3 %	*145*
Central government/Commonwealth	88.9 %	*18*	81.8 %	*22*
Local government/state government	73.6 %	*53*	66.7 %	*51*
Education authorities	50.0 %	*8*		
Health authorities	72.3 %	*47*		
Academic/research institutions	88.9 %	*27*	66.7 %	*30*
Consultancy/market research	53.8 %	*13*	42.8 %	*21*
Private firms	88.4 %	*34*	71.4 %	*21*
Other	78.9 %	*19*		
Not answering question	18.0 %	*278*	12.8 %	*166*

Yes, now that extrapolated estimates are available as well.

Yes, but not sufficiently reliable.

Among those who said 'no', drawn from all sectors, were the following comments:

Could series PP2 be annual? (A charity for the elderly)

If the official projections had been more realistic then they may have been sufficiently frequent. We keep hoping the next ones will get better! (Tower Hamlets Health Authority)

Slippage between official projections and the latest estimates are a continual problem. (South West Regional Health Authority)

No, but more importantly they are late (especially at regional/county level). [We] consider that the OPCS/GAD process should be speeded up so that projections reflect the latest trends. (Cleveland County Council)

Problems arise in assessing whether development plans can be 'up-to-date' in the context of the 'most recent' demographic data and household data (a construction industry trade association).

Some ambivalent answers arose from multiple use:

'Yes' for most users, but one needs quarterly projections (OPCS Social Survey Division)

and the multiplicity of projections with which the enquiry was concerned:

DE 'yes' [Labour Force projections]; OPCS PP series too wide apart (economist in the Post Office HQ).

6 Use of projections other than the official: who makes, why and how?

One third of both samples made their own projections, particularly outside central government, including the private sector. This suggests that the official projections do not meet all demands, and we feel it is worth reporting the responses from both countries in some detail, while remembering that two thirds of our respondents seemed on the whole satisfied with the official product.

Who makes their projections?

Of 95 answering this question, 15 of the form fillers said they personally made the projections. They were widely spread:

- 2 statisticians in the Home Office
- 1 principal statistician, Northern Ireland Civil Service
- 1 deputy director, Welsh Development Agency
- 3 planners from East Sussex and West Glamorgan County Councils and the Highland Regional Council.
- 3 education officers (or assistant EO) - Warwickshire, Cornwall and Harrow
- 1 information assistant, Marriage Research Centre
- 3 academics: a demographer, a gerontologist and a geoscientist
- 1 freelance consultant
- 1 marketing/stores planning executive for a retail chain

Most of the respondents named their own organisations. Several central government departments make derived projections of particular sorts of population: the labour force (Department of Employment); households (Department of Environment), students, school leavers, teachers, etc (Department of Education and Science); and for internal Home Office use, persons entering the criminal justice system.

County councils and metropolitan districts, mostly making basic demographic projections for their own areas, and smaller areas within them, varied as to whether it was the planning department or the chief executive's department that was responsible for making projections, but more often planners.

Education authorities in the counties sometimes made their own projections of school rolls, and sometimes drew them from elsewhere in the local authority or from the DES.

Health districts on the whole took their projections from the regional health authorities who use projections supplied by OPCS, but there were some examples of alternative sources of projection at the local level.

In Trafford, a new district in 1974, the district health authority and the local authorities made a joint initiative to produce projections.

Others have a less happy account:

Our health district projected population comes from two sources: Department of Health and Essex County Council. They are different! This causes some problems when planning with social services.

The last projections produced by us were based on 1985 mid-year estimates. We now feel our projections give a better picture of current populations than OPCS estimates since the latter have not been able to take local migration trends into account. (Wessex Regional Health Authority)

An education department reported:

There is a major problem reconciling official projections (e.g. those of DES based on OPCS) with our own local

projections. The conflict lies in the assumptions made by OPCS (broadly the continuation of existing trends) and by the county council (based on structure plan policies which seek to change those trends). As a general rule we prefer to use our own projections based on local knowledge and needs.

Noteworthy among the external suppliers of projections were the London Research Centre, the Chelmer Institute and CACI. The LRC survives from the days of the Greater London Council and was described (in its own response) as

The research and information scheme for all London boroughs in a number of fields, including demography, especially projections.

A user in a London borough said:

This authority generally uses the projections produced by the LRC in preference to OPCS, because they have generally been more accurate in the past. Having compared the two most recent sets, total figures are now similar although there are differences within the age groups. We shall continue to use LRC projections as these take account of dwelling stock changes.

LRC projections are also used in some health districts, Islington for example:

The Health authority serves a population coming from other health authorities as well as serving the majority of Islington's resident population. We want to be able to select population in areas within Islington and other HAs in order to give us an estimated population that [we] actually serve. The only possible means, at present, is to look at small areas at electoral ward level and aggregate from those wards from inside and outside the HA. We have sought LRC projections for this purpose.

This respondent also stated that OPCS estimates and projections were used for different purposes, to give a broad idea of the population served and to compare it with that of England and Wales.

The Population and Housing Research Group at the Anglia Higher Education College has developed the Chelmer model, which can be used at a local level. It is based on a 'what if' structure that can explore alternative outcomes of varying assumptions, particularly on migration.

CACI is a consultancy firm supplying information to clients on small areas from the census. It also makes projections to the year 2000 for small areas, and is thought to be the only commercial organisation doing so.

West Glamorgan County Council, one of the few non-metropolitan areas to suffer from high migration loss in the early 1980s, told us of the circumstances in which they commissioned alternative projections from academic consultants. The population loss occurred at a time of economic restructuring and redundancies.

The Council contends that this was a one-off period and exposes the weakness of using past trends for future projections ... We have successfully lobbied the Welsh Office ... with the 1987-based projections matching more closely the Councils own view [than did those based on 1983].

In Australia, areas of application for 'custom made' projections include leisure research, planning for ageing populations, the motor industry, TELECOM, educational enrolments, insurance, electricity boards and banking corporations as well as many planners of land and housing departments.

A relevant question about those who make their own projections is what other types of projections are they consulting. Table 12 shows that most of those who make their own also consult official projections, in both countries. In each survey, the same percentage, 75 per cent, of those making their own projections also consulted the official subregional/state projections, probably as bases for and to complement their own.

Table 12 Percentage of own projection makers by types of projection consulted

Types of projection	Percentage consulting projection
United Kingdom	
National population	77
Regional	67
Subregional	75
Household	66
Labour Force	64
Other	25
Number making own projections	*95*
Australia	
National population	67
State population	84
Sub-state population	75
Annual population forecasts	49
DILGEA forecasts*	27
Other	36
Number making own projections	*55*

* *Department of Immigration, Local Government and Ethnic Affairs.*

Most 'custom-made' projections are for small areas. The very breadth of applications suggests that official sources will never be the most effective providers and that what is required is accurate forecasts which can be readily adapted.

Why do they make their own projections?

Typically our respondents made their own projections because official projections were unavailable for their area or purpose.

For example the director of an Australian research unit commented that

> *Published projections are not used because they do not cover the area or the time period needed or because they are dated.*

Table 13 Reasons given for not using official projections in United Kingdom

All types of reason mentioned	Percentage giving reason
Area not covered	41
Official projections inaccurate or unreliable	29
Need to bring in local factors	20
Disagreement over official method	18
Need particular population characteristics	15
Insufficient details in official projections	14
Need variants	10
Difficulties in getting access	6
Official projections infrequent	5
Other reasons	25
Sample numbers	*96*

The various reasons given in the United Kingdom are summarized in Table 13. The pattern of responses, involving lack of official projections appropriate to users' particular needs, and doubts about the accuracy or reliability of available projections, is repeated in both countries. The leading reason, geographical coverage, is mentioned by 41 per cent of the United Kingdom users. OPCS projections go down to the shire county/ metropolitan district level (and health districts), but not to local authority districts or wards. Doubts about accuracy and reliability occur in 29 per cent of the answers. The need to take local factors into account is also prominent. Those disagreeing with official methods were mostly worried about internal migration, as in Australia. A number of the other reasons summarised in Table 13 cover users needing projections for particular populations or client groups, and those wishing to vary assumptions on which projections are based.

How are these projections made?

A variety of methods are used ranging from ad hoc methods to simple statistical methods, and to complex demographic and economic models. The methods used in the United Kingdom are summarised in Table 14.

More than half the responses mentioned the basic cohort survival method, or component projection, modified in most cases by assumptions about migration, information about housing, or both. The Chelmer model is a particular case of both housing and migration information modifying a cohort survival model. Mathematical time series methods appear only to be used by one academic respondent (in Scotland), but simpler extrapolation methods are used for CACI's small area projections. Respondents in health districts reported calibrating projections to adjust to different boundaries, and one of them simply described his method as 'adjustments'. Methods dominated by the use of local information include education

Table 14 What method is used by those making their own projections? (United Kingdom survey)

Main method cited	Percentage citing method
Cohort survival method	17
Cohort survival and migration assumptions	12
Cohort survival and migration and housing constraints	11
Housing-led or constrained methods	7
Time-series extrapolation	7
Chelmer Model	7
Adjustment or calibration	6
Use of local information	8
Synthesis of various methods	5
Econometric or other models	6
Other	13
Sample numbers	*99*

officers taking information from head teachers. The econometric methods reported were not so much for making demographic projections (although one, not covered, has been developed at the National Institute of Economic and Social Research), as for making derived projections, such as those made by a consultant, of first-time home buyers and users of energy.

Methods reported in the Australian survey are categorized on the following lines:

Cohort-component method: This is a very common method. In the Applied Population Research Unit, Queensland University, this method is used with component profiling.

Modified cohort component method: Cohort survival tempered by local data such as dwelling approvals, births, deaths and enrolments.

Complex models: These include further elaborations of the cohort component model, and similar methods; economic-demographic structural models and auto regressive time series (AR) models; housing unit method, trend-ratio techniques, an adapted employment/population projection model; methods based on net migration (by a city council affected by high migration); life tables, births, deaths, building activity, etc.

Enrolment projection related methods: Including methodologies specifically designed for projecting primary and secondary enrolments; census of student populations by school, historical retention rates and surveys of residential development.

Modified official: A number of users modify official projections to satisfy their special requirements for smaller areas, marketing purposes or time span. These include modification according to a variety of ancillary information, for example an Electricity Board's customer number projections.

Table 15 Use of variants by United Kingdom users, by sector

Sector	Fertility	Mortality	Net Emigration	Own	Other	No Variant	Sample number
			Percentage in each sector using variants on projections				
All	46	36	20	23	13	30	*212*
Central government	41	35	18	18	12	24	*17*
Local government	46	28	17	57	19	20	*54*
Education authorities	20	-	-	30	10	50	*10*
Health authorities	67	62	18	3	8	23	*39*
Academic/research institutions	75	75	29	14	18	7	*28*
Consultancies/market research	50	30	30	40	20	30	*10*
Private firms	17	17	17	6	8	64	*36*
Other	33	11	33	-	6	33	*18*

Number not answering = 66.

Extrapolation of past trends: These comprise projections of past rates modified in accord with better information, used by a health planner for small areas; past trends-simple forecast based on known influential variables as used by a market research society.

Statistical techniques: Apportionment method of official projections for health regions; multivariate analysis after hearing informed opinions (professional consultants); age-specific regression method of projecting, for example persons over 30 needing residential care as used by a state authority for intellectually handicapped persons; ratio, cohort survival, and graphical methods; iterative proportional fitting for disability types to derive estimates by LGA; aggregate and stochastic used by an actuary of a consulting society.

Others: These include using census data as benchmark, building (dwelling) commencements compiled from small areas and compared and other available projections; and use of housing industry statistics for projection of new growth areas in a city.

7 Who uses variants?

Although component method based projections are expected to contain a set of variants, it is not known whether users utilize them. We aimed to assess the level of use of the different variants with respect to the major components of population dynamics.

The question about whether various variants on projections were consulted yielded at least one answer from 212 respondents in the United Kingdom, 98 of whom consulted the fertility variants in official projections, 77 mortality variants and 42 the alternative assumption about international migration. These represent 46 per cent, 36 per cent and 20 per cent respectively of the answers given to this question. Twenty-three per cent and 13 per cent said they used their own or another variant, many of which concerned internal migration. Thirty per cent of the valid responses can be positively identified as not consulting variants at all.

Use of variants was about the same in public and non-profit sectors, twice as high as in the private sector. The groups most likely to consider fertility and mortality variants were academics and health authorities. The education authorities were conspicuous for a low level of interest in either variant on vital rates. Almost all users of fertility variants, looked at both the high and low variant published, but 4 responses indicated an interest in only the high variant. Among these were a national voluntary organization concerned with child-care for the under-fives. Perhaps they were more concerned to plan for an increase in their clientele than for a fall.

Similarly, virtually all the users of mortality variants used both. The sectors most likely to consider the official variant on international migration were the trade unions, consultants, and academics.

The level and sectoral pattern of use of variants is very similar in Australia.

Who wants more variants and who does not?

When asked whether more variants on official projections were desirable, the valid responses divided roughly evenly between the 71 who wanted more - most of whom already used variants, the 75 who used variants but did not want any more, and 69 who did not use any and did not want more. The minority wanting more variants was at its highest among health authorities.

Some of the respondents explained the drawbacks to using variants. Variants in short-term local projections used in resource allocation could become political footballs, and

defeat the purpose of achieving an agreed and equitable distribution of resources. Many other decision makers, it would appear, would prefer a central best estimate to a range, particularly if the certainty attaching to the range is not clear.

To the user of the statistics the existence of different variants can be confusing and requires careful explanation. (An education authority)

Table 16 Whether users in United Kingdom want more variants

	Would more variants in official projections be useful?			*Sample numbers (= 100%)*
	Yes	No	Other answer	
All	% 33	66	1	*218*
Users of variants	% 41	58	2	*130*
Those not using variants	% 20	78	1	*88*

Numbers not answering = 60.

A senior planner in Wandsworth would like projections to contain more information on statistical reliability/confidence limits - best projection, low projection, high projection.

Details of own or other variants consulted

There were 68 responses, 48 from those who made their own variants, mostly (40) users of their own projections. A major part of the responses (35) came from local government and they usually made alternative assumptions about internal migration and housing change.

London boroughs and at least one London health authority who use projections made by the London Research Centre, also make use of its variants: fertility high and low, and migration - housing-led or trend.

Apart from these major themes a variety of other variants were reported by individual users: Oxfordshire County Council uses variants on the estimate of students and military population (the latter also mentioned by Hampshire and Wiltshire).

The National Union of Journalists uses variants on the percentage entering higher education, in its assessment of the availability of young people to those recruiting trainees in journalism.

PAPRI, a research institute making pension cost calculations, uses a 'very low fertility' variant and wants to see a greater range of fertility variants published.

The Institute of Employment Research makes variant projections of economic activity.

8 In what medium are projections received?

Table 17 shows the answers by British users to a question about which of four media were the vehicles through which they received projections, and which would be their preferred medium. The question did not allow for all possible forms of dissemination. For example in some health regions districts have on-line access to a regional computer. Aside from the conventional published tables on paper, OPCS provides microfiche, and for national but not subregional projections, the data is also released on diskettes. As can be seen from Table 17, printed tables were mentioned frequently as both an actual and a preferred medium. Disks are not actually widely used, but there is a big demand for them, as well as a good deal of confusion about their availability. Microfiche are unpopular ('a pain to use' according to several informants).

Table 17 Medium in which United Kingdom users receive projections and their preferred medium

	Printed tables	Micro-fiche	Computer tapes	Computer disks
	%	%	%	%
Medium actually received and preferred	65	5	3	12
Actually received but not preferred	26	10	3	-
Preferred but not actually received	3	1	6	44
Medium not mentioned	8	84	89	44
Sample cases (= 100%)	*267*	*263*	*263*	*264*

The main difficulty in using projections has been the inability of OPCS to supply data on standard IBM disks. Unless this has changed, this is a serious deficiency when increasingly researchers are using powerful personal computers. (National Youth Bureau)

A health planning consultant is also concerned about circulation methods:

There is an obvious need for population projections to be made available with relevant boundary coordinates on a CD ROM as is done in a number of other countries. This would overcome a major time problem in getting access to information from OPCS.

In Australia, both official producers disseminate their projections in an accessible form. Technological improvements through the use of computer disks have been widely appreciated. Although there is little evidence, so far, of demand for telestats (a service like Oracle or Prestel in Britain) this will probably come in the future.

9 What the users say

The majority of United Kingdom respondents appeared, on the whole, to be satisfied with official projections, though they also offered a number of suggestions for improvements. Some of those not already cited are presented in this section along with some of their general comments.

OPCS - a helpful service - gives guidance and assistance with regard to their various population-based data. (North East Thames Regional Health Authority)

We find the national (E&W) age-specific projections from OPCS invaluable as a basis for projecting future changes in numbers in the early stages of the criminal justice system - crime rates vary substantially by age and sex. (Home Office statistician)

The District of the Wrekin Council suggest:

A PC based population projection model, based on OPCS models, be supplied for local use. The main priority at district level is getting accurate migration flow volumes and sex/age structure. The National Health Service Central Register data and Family Practitioner Committee data could be better used.

This respondent also pointed to the need for better household projection components.

We are restricted in our analysis of migration trends by NHS Central Register transfers being limited to Family Practitioner Committee areas : inter-borough flows are needed. We should be starting to analyse fertility by cohabitation rather than marital status, in view of the very large proportion of children now born outside marriage. (London Borough of Camden)

A planner in Scotland suggested a better source of data:

The community charge register would provide detailed small area figures on population movement, migration and age profiles. Currently the legislation does not allow access to this for research purposes.

It would be helpful to know what assumptions have been made when producing the projections. We are very unhappy with the projections as they do not adequately take account of developments within Docklands. (Tower Hamlets Health Authority)

The brewery company forecasting manager would also like to understand more about the validity of robustness of the base case assumptions. He suggested that this information, which is probably available within the various OPCS publications, should become more approachable and user-friendly.

An economist from the Post Office had these comments to make:

Labour force projections give an excellent presentation and explanation of methods; easy access, timely updates... DoE household projections are difficult to obtain (why can't they be available through HMSO bookshops?) and updates are irregular.

This user also regretted that the circulation of PP2 and PP3 is poor, and updates slow to arrive.

10 What the users want?

It should be helpful to summarize the demands emerging from the United Kingdom responses, again remarkably similar to those we obtained in Australia. What the users want is listed below:

- Finer geographical breakdown of projections, involving improved methodology for smaller areas - towns would be good, wards better.
- Better information on the present.
- Variants on internal migration assumptions.
- More frequent household projections.
- Some authorities concerned with local service provision would like socio-economic indicators projected.
- A minority want more variants on national projections, most not.
- Overwhelmingly the users want their data supplied on disks.

Conclusion

The aim of this paper was to investigate the belief that population projections have very broad and increasing applications. It is clear from the two surveys that this is so: almost all our respondents use projections and the applications cover an enormous spectrum. Furthermore, there is a striking similarity in the areas of application between the United Kingdom and Australia.

The major growth areas are planning and policy making, particularly the health service and industry. Both in-house and through consultants in the private sector and academe, projections are being widely used in marketing and for personnel recruitment, although there remains a potential market as our analysis of non-users shows. There is little methodology at present in the use of projections in business decisions. While business confidentiality may preclude the release of individual strategies the potential exists for collaboration with academics in the development of such a methodology.

Our research has also identified the time span and the level of aggregation as crucial questions that any intending projector must settle. Both are specific to the particular application and individual cases may require combinations of each parameter.

For example, education planners need short-term forecasts at local levels for individual school enrolments combined with short and long-term district forecasts to project future enrolments across a range of schools.

The methodologies for these different types of projections vary. For relatively large areas standard component methods, modified perhaps by some inter-area accounting approach, would seem to be best. But some users lack knowledge of the underlying assumptions, or even an awareness of the need to consider them. An education programme on the use of projections would probably be very useful, particularly on the importance of non-demographic factors in some applications - such as those sensitive to economic change.

Official projections are thought highly of for relatively large areas. For local areas there was some disquiet over official projections, both in their accuracy and time spans. This was reflected in the large number of users who resorted to making their own projections as well as in particular comments. As this is the area in which most of the increase in the use of projections has taken place it is important to recognise that component methodologies play only a partial role. Over the longer period, modified component methods - using ancillary local information - can be used. However, many users require only short-term forecasts - in essence, decent small area estimates - and for these, alternative approaches such as raking and synthetic estimation become important.

An obvious solution would be for the official organisations to produce high quality small area estimates. However, the diversity of applications - requiring separate ancillary information - may mean that such estimates would always be best produced at the local level, with the disadvantage, to some, that the sum of local projections does not necessarily add up to projections made at higher levels of aggregation. We would like to put forward two suggestions:

(i) development of some expert system shell holding up to the minute data from the official organisations and allowing users to add their own information to produce small area projections;

(ii) as the methodology of small area estimation appears to be a skill required of many applied demographers, there is a need to improve training in this area.

Finally, projections will always differ, but if they are to have credence to policy makers and planners across a wide range of applications, then those made by the major producers should agree or at least spell out carefully the sources of any differences. This requires communication and coordination between producers, as well as the communication between users and producers which we hope this paper and this conference will enhance.

Bibliography

(Compiled by Jan O'Brien)

References to published projections and publications making use of projections, mainly from responses to the surveys. Note that this is not a comprehensive bibliography of all relevant material, but a compilation of references assembled during the course of writing the report. Prices are reported where known. Absence of price does not necessarily mean zero price. Dates of publication were also not always reported.

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Burke, T., Swinburne Centre for Urban and Social Research.
Dasen, S. E., School of Education, La Trobe University.
Day, L.H., Department of Demography, ANU.
De Rody, B., Victorian Department of Labour.
Egmond Karie var, The Sun.
Elvidge, N., Darling Downs Regional Information Service
English, B., Department of Social Work, University of Newcastle
Giorgi, B., City of Werribee (VIC)
Glova, J., SAHC.
Hall, P., City of Salisbury
Harrison, G., Census Applications PtL
Haworth, B., AGB Research
Houghton, D.S., Department of Geography, University of WA
Hockey, R.L., University of WA
Hull, T.H., Department of Political and Economic Change, ANU
Jayasuriya, D.L., Department of Social Work and Social Administration, University of WA
Kerr, R.H., Commonwealth Department of Social Security
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Pittarello, A., Migration Studies and Media Centre
Prior, B., Uniting Church in Australia
Pyzik, R., South East Queensland Electricity Board
Robb, W., Queensland Department of Education
Rudd, D., School of Social Sciences, Flinders University of SA
Seitz, A., Swinburne Institute of Technology
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